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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

An Illustrated Journal of Mining, Mechanics and Popular Science

VOLUME LXIX. Number 1. SAN FRANCISCO, SATURDAY, JULY 7, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

PLACER MINING IN ALASKA.

"Plenty of room in Alaska," says a citizen of Juneau. Then he goes on to illustrate a country as large as that part of the United States east of the Mississippi, inhabited by a white population about equal to that of Woodland and a total population equal to Sacramento. In round numbers these people buy two million dollars' worth of goods and sell eight million dollars' worth of products annually. Plenty of work here and good results.

Placer Mining.—Although it cuts a small figure among the great interests of Alaska, placer mining is now attracting most attention from the public. As usual, the center of attraction is the most distant field, away off near the great bend of the mighty Yukon, where it is almost under the Arctic circle and can be called the land of the midnight sun.

THE QUEEN AT TREADWELL'S WHARF, JUNEAU ON THE RIGHT, DOUGLAS ISLAND ON THE LEFT.

It has been very hard to obtain the latest information from that region or to locate the new mining camps, for there is hardly a man in the city who has ever been there. It seems that the last one of them has gone back to the diggings. From 350 to 500 went in this season over the Chilcat Pass from Juneau. Others remained there another winter, and it is estimated that one thousand miners and traders are now in the valley of the Yukon.

Those who enter by way of the pass generally take a small outfit of tools and provisions weighing 500 to 700 pounds, and expect to reach the diggings after five or six weeks of climbing mountains, sailing across lakes and sliding down the current of the river, shooting two or three rapids and making a few portages.

Monopolists.—The Chilcat Indians have long claimed a monopoly of the overland route to the Yukon, and charge $15 per cwt. for packing to the summit of the pass.

Then it is customary to build a boat or raft on the shores of Lake Lindeman to carry the load to the mines.

Lieut. Schwatka in 1883, had a raft about 12x30, that he afterwards enlarged to 14x42, and carried his outfit nearly 130 miles.

He was forced to make a few portages and there were many difficulties to be overcome. The raft was a simple affair made of small logs fastened together with wooden pins.

Stores at the Diggings.—Forty-Mile Creek is the metropolis of the Yukon diggings. There is a store supplied from St. Michaels by the Alaska Commercial Company, and kept by L. N. McQuestin, who entered the service of the Hudson's Bay Company about 40 years since, and who now carries a stock worth $125,000 to $130,000.

Mr. Healey, who formerly kept a miners' outfitting store at Lynn Canal (where they leave salt water to go over the Chilcat pass), has interested a Chicago syndicate to ship goods from Seattle to the mouth of the Yukon by sailing vessel, and thence by small stern-wheel steamer to his new store at Forty-Mile Creek. In an interview with Richard McQuestin, a twelve-year-old son of the pioneer, who is here attending school, he informed the MINING AND SCIENTIFIC PRESS that Mr. Healey has rather a larger stock than his father.

The river boats charge $5 per cwt. freighting goods up the Yukon, and the captain of the Bertha informed us that the Alaska Commercial Company charges 50 per cent in addition to the wholesale price at San Francisco as their price to dealers at St. Michaels. This is their distributing point near the mouth of the great river.

Their representative informs us that goods retail at the mines on the Yukon at about same rates as other remote mining towns on this coast. Goodall, Perkins & Co., in their pamphlet "All about Alaska," quote what is presumed to have been McQuestin's prices for '93:

Flour	$17 per cwt.
Bacon	40 " "
Beans	20 " "
Sugar	33 " "
Dried Fruit	25 " "
Butter	75 " "

With larger stock and active competition it is fair to presume that prices will rule lower for the season of '94.

School at the Mines.—Young McQuestin says that Forty-Mile Creek (or Mitchell, as the postoffice is called), has about 300 people. Of these, 75 are school children and 10 or 12 of them are white.

They had six saloons when he left home last August.

As many who went in this spring from Sound ports and from Juneau follow that line of business, it is fair to presume that things are lively by this time, and that the "'49 Mining Camp" is acted out in real life. There is nothing in the Governor's late report to indicate that they have ever had any law on the Yukon, and very little in other parts of Alaska. We may guess that they are a law to themselves and that gold dust is safe.

Capt. Carroll, of the excursion steamer Queen, kindly favors us with a letter from his old friend Aylward, well known at Juneau and about the Treadwell mine:

FORTY-MILE, YUKON, January 15, 1894.

FRIEND CAPTAIN CARROLL:—For old friendship sake I thought I would let you know my whereabouts, hoping you are well as your humble servant is at present. I had no desire to come to this place, but I am not hard to bluff when there is a lawsuit in view; however, I am not sorry, as this is a better country. There is really nothing known as yet how extensive the gold is here. I must say men who have been here for the last five or six years have made poor use of their time; however, there has been no grub in the country up to the time Healy came. His scheme is a good one and he ought to do well. Now, friend Captain, I believe I made the grandest discovery last summer that was ever made in this Yukon country, and in coarse gold I got as high as $13 to the pan. The gold is like pumpkin seed, but some pieces weigh $3, $4, $6, $8 and $10; but I think $40 or $50 will be a common thing when I get the claim opened up. Why, Captain, I would get $15 or $20 under a little stone where I could find bedrock. I will send you a nugget next fall when I get one that will suit.

Captain, I did not leave Juneau broke. I had about $2000 when I left there, and it was quite a help to me. If I had to rustle for grub I would not have made the discovery. I have seen no quartz as yet that I want. If I ever do, I will not forget you. I wish you would send me something to read by Healy or the Alaska Commercial Co. boat. Good-by, Captain! Your friend, ED AYLWARD.

This looks like a pretty big story, to a tenderfoot, but it has been a source of considerable amusement to read it to old miners and see the blood tingle in

(Continued on page 6.)

MINING AND SCIENTIFIC PRESS.

Office. No. 220 Market Street, Northeast Corner Front, San Francisco.
Take the Elevator, No. 12 Front Street.

Terms of Subscription.

Annual Subscription, $3. New Subscriptions will be declined without cash in advance. All arrearages must be paid for at the rate of $2.50 per annum.

Advertising Rates.

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Entered at the S. F. Postoffice as second-class mail matter.

Our latest forms go to press on Thursday evening.

San Francisco, July 7, 1894.

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With this issue, Number One of Volume Fifty-nine, the Mining and Scientific Press appears in a new dress throughout.

The "Midwinter" fair which extended into midsummer has officially closed. Opiuions differ as to its utility and result. That it was a financial success in these times of depression is creditable to the executive ability of its projectors; that it has been a good advertisement of the State at large is obvious. It is believed that its greatest good and most material benefit lie in the larger acqnaintance made by State residents of the extent and resources of the commonwealth, and the resultant increase in State pride and progress.

An instance of extreme couservatism is afforded iu the great demand for Mexican silver dollars in India, China, Japan aud Singapore, 25,000,000 being aunually exported from Mexico to those countries. More than a generation ago there was a lack of native coiuage and American traders happening to get hold of some kegs of Mexican dollars introduced them. That coin became "naturalized" iu the Orient, and in spite of the local coiuage it is iu constant demand. Another singular fact in connection with the eagle dollar is that though it is intriusically worth more than the American silver dollar, yet, to pay a debt that 100 American silver dollars would pay in this country would reqnire 203 Mexican ones.

THE CHILEAN EXPOSITION.

The coming exhibition at Santiago opens September 1st. The Acapulco leaves here uext Monday, carrying considerable from this city for exhibition there. The Union Iron Works sends a five-stamp iron frame battery gold mill complete; the California Powder Works, dynamite; the Selby Smeltiug Co., lead and tin pipe; Palmer & Rey, a mining hoist; Paraffiue Paint Co., roofing paper, pile coveriug and electrical insulators; J. Hendy Machine Works, hydraulic mining machinery, ore wagons, whim and water gates; F. A. Huntington, roller quartz mill complete; G. E. Woodbury, concentrators; Union Gas Engine Co., 12-horse power gas engine; Pelton Water Wheel Co., water wheels and motor; W. W. Montague & Co., iron pipe.

W. C. Quinby has charge of the above, and goes ou the Acapulco to remain during the exhibition, which lasts four months.

MARIPOSA AS A MINING COUNTY.

All along the foot-hills of the Sierras, embracing in its scope the entire gold belt of California, for the past two years there has been a manifest revival of that productive industry upon which was founded the prosperity of the Pacific Coast. The initial movement which awakened a renewed interest in gold mining was made by the Miners' Convention in January, 1892. It may be said of that body that "they builded better than they knew;" for, though their immediate object was the rehabilitation of hydraulic miues, it incidentally attracted attention and gave a healthy impetus to the quartz mining industry from the Oregon line down to the Mexican border. Mariposa is only occasionally heard from. It is forty miles from the nearest railroad, without telegraphic facilities and, from these and other local causes, has fallen into the habit of trailing along in the rear of the processiou. Recently the old county has been showing symptoms of vitality. "Faint signs of life," says a correspondent who writes hopefully from the county seat; and another claims that "the prospects are more encouraging than at any period since the flush times which practically faded out about the year 1870."

It will be remembered that, in the early stages of quartz mining, the appliances for hoisting ore aud pumping were crude. The same may be said of the methods used in blasting and milling. The old Mexicau arrastra was not yet obsolete. Giant powder and Burleigh drills were unknown. As a rule, the mines were richest in free gold near the surface. Whenever the lode ran into low-grade ore or sulphurets requiring processes for handling not then in general use, work was suspended aud the general opinion was expressed that the mine was "worked out."

It has been long ago demonstrated that it reqnires a healthy capital and skilled management to profitably operate a gold mine to any great depth.

Placer mining, as a means of makiug a bare subsistence even, is hardly recognized—the chances there being very few and far between; so the occnpation of the old-time miner is gone. Occasional pockets, in decomposed quartz, are struck by prospectors, but as the years roll on, the chauces of success in this precarious occupatiou become more infreqnent. The change in conditions places gold-mining here upon the same basis as the great producing mining properties of other localities in California and adjacent States and Territories. It has become a business proposition involving the investment of capital and techuical skill.

It is safe to say that there are few better fields in this State for mining operations thau old Mariposa. Several erroneous impressions have goue abroad regarding this couuty which have had a tendency to retard enterprise. Men without experience in the business have purchased properties upon the representations of alleged "experts" who knew nothing of miues nor of miuing. Immense outlays have been made iu mills aud machinery upon gilt-edged reports. Villages, hotels, warehouses, assaying works have been constructed on surface indications till the men who were furnishing the coin became weary and quit before real, practical work had commenced. The connty abounds with the debris of these monumental failnres. This statement applies to nearly every mining district iu Mariposa county including the Fremont grant sometimes known as "Las Mariposas."

Without going into details as to the changes of ownership and manitold phases of manipulation of this property, a glance at the preseut conditions involves a brief retrospect—premising that people who have had no opportunity of personal observation make the mistake of confouuding this patch of 44,000 acres with the entire couuty. Outside of the State of California this miscouception of the territorial condition is nearly uuiversal, while the same error prevails in distant localities withiu our own borders. It may be here meutioned that the "grant" comprises less than one-tweutieth of the entire area of Mariposa. It does, however, contain some valuable mines. It iucludes within its scope the towns of Mariposa, Bear Valley, a remnaut of Princeton, and several other sites of towns which have a sort of shadowy existence in tradition and history. Its northern boundary is the Merced river, aud it extends, in an irregular form, southerly, to a line about three miles south of the town of Mariposa. The principal mines, which were successfully operated by some of the former owners and gave a world-wide reputation to the property, were the Josephine and Pine Tree at Bear Valley, the Mt. Ophir, Greeu's Gulch, Princeton and Guadalupe, near the town of Princeton, and the old Fremont mine, near the town of Mariposa. Work on an extensive scale was suspended all along the line uearly twenty-five years ago, the shafts and tunnels having caved in, the mills have been dismantled and machinery rusted and ruined by exposure and disuse. In 1887 it was purchased by a syndicate of mining men, consisting of Flood, Mackay, John P. Jones and Hobart & Hayward, who subsequently incorporated under the name of the Mariposa Commercial and Mining Company, represented at present by John P. Jones, Sam Jones, Alvinza Hayward, the estate of Hobart and Johu Mackay. There were some good reasons for believing that work would be commenced on a grand scale, but something intervened and the mining operations up to date have been limited to prospecting. James Cross was manager of the property for three or four years, and under his superintendence the Pine Tree and Josephine mines, near Bear Valley, were opened up aud thoroughly explored. The results, so far as known, were satisfactory, but the freshet in the spring of 1890 swept away the Benton mill dam, and with that, the power which ran the Burleigh drills, and prospecting in that locality was suspeuded. There was the usual amount of current rumors afloat about the intentions of the owners but in one form and another, since the survey of a dispute for a miuing ditch nearly forty years ago, these rumors have been circulated with the regularity of the eqniuoxes, till they have come the precession of stale and harmless jokes. About be tolerated as two years ago Mr. Cross retired from the mauagement aud is now attending to the estate of his old personal friend, Hobart, deceased. Since that date until quite recently nothing has been done.

The latest advices are to the effect that permits have been given to miners, under certain conditions, to prospect within the boundaries the "grant"—the compauy retaining a royalty in case of discoveries of paying mines. A. C. Hamilton, familiarly known to mining men in California and Nevada as "Lon" Hamilton," succeeded Cross as manager. With the exception of the encouragement of prospectors above referred to, no change in the policy of the owners has been made. If any great mining operations are contemplated—such as will involve the construction of a dam on the Merced, the transmission of electric power for runuing mills aud hoisting works, or a tramway or narrow gauge road conveying ore (either of which propositions might be a factor in the thorough development of the property)—then the owners thereof are not advertising their plans. A small quartz mill has been erected in Missouri gulch, about a mile from the town of Mariposa. This is within the lines and on the list of individual concessions. It was completed late in the season last year, the origiual intention beiug to run by water power. An overshot wheel, or some motive appliance akiu to it, was constructed, but a serious trouble intervened. For nine or ten months of the year there is hardly water euough available iu that locality for domestic purposes. In the summer months two pack mules, a saddle horse and a thirsty man drink Missouri gulch dry, and iu seasons of great drouth there is only one spring within a mile of its south where even a drink can be obtained. These facts dawning upon the builders of the mill after awhile a small engine was purchased, steam power substituted, and the mill moved. The projectors of the enterprise are engaged in crushing quartz iu "lots" for prospectors, and the cheerful rattle of the stamps awakens the inhabitants in time for breakfast, aud gives a cheerful tone to the town and its surroundiugs.

"It is a little five-stamp trick about the size of a deuce full," remarked a sportive mountaineer from the "Butterfly county" iu describing it to a group of his acquaiutances as they sauntered through the mineral department at the Mechanics' Fair and gazed admiringly on the collection of ores from Mariposa; yet it seems an admirable purpose for testing ores by a milling process, reckons the pulse of expectant people and furuishes occasional item for the local paper.

Concentrates.

DENVER banks are reported paying a premium on gold.

THIRTY-FIVE men are engaged in placer mining in and around Susanville, Or.

WORK has been resumed upon the Rose Rock mine at Indian Creek, Calaveras county.

THE Stockton *Record* complains that the lotteries take $5000 every month from that community.

THE Griffin Gulch Gold Mining Company has been organized to develop placer mines near Baker City, Or.

AT THE Julian (San Diego county) mine the ore averages $10 a ton. It costs $4 per ton to mine and mill the ore.

THE carbon reduction method of gold extraction will be given a trial in a $200,000 plant now building at Florence, Cal.

THE new copper smelter at Salt Lake is at work on 6,000 tons of ore from the Copperopolis mines in Box Elder county, Utah.

THE Brown's Valley Gold Mining Company has incorporated; principal place of business, San Francisco. Capital stock, $100,000.

FIVE HUNDRED DOLLARS' worth of plates were recently stolen from Heald's mine in Nashville and brought into Amador county.

THE New York mine, near the W. Y. O. D., and the Greeley Blackman mine, on Deer Creek, Nevada county, will shortly be reopened.

THE Gopher-Bowlder mine at Kelsey has been sold to W. A. Bell, who is also negotiating for the Delmatia and St. Lawrence mines.

THE Hartford Mineral Land Development Company, capital stock $100,000, proposes to develop several quartz ledges near Loomiston, Wash.

THE World's Fair Gravel Mining Company, principal place of business, Nevada City, capital stock, $1,000,000, has filed articles of incorporation.

EIGHTY MEN are now working the Mahala mine at Leadville. Two hundred tons a month of sulphide ores are taken from the shaft in the carbonate contact.

THE Tennessee mine, near Kingman, Arizona, is shipping 10 carloads monthly through that city to Pueblo. The ore runs nearly 70 per cent in lead and 20 ounces in silver.

SUPERINTENDENT STAUNTON of the Congress mine, Arizona, says that a new water supply has been developed at the mill, and the forty stamps are running night and day again.

FIVE Spokane prospectors have started to the Clearwater river to spend the summer hunting gold and, if possible, to seek the body of Colgate, the lost guide of the Carlin party.

THE Elko *Independent* says there are a good many miners going into the Bruneau and Mardis country from Deetb. Loads of merchandise and machinery are leaving there nearly every day.

THE 191st regular monthly dividend of the Homestake Co., of 15 cents per share ($18,750,) was paid on the 25th ult. The total paid to date is $5,175,000 and this from ore averaging less than $3 per ton.

THE Rio Grande smelting works at Socorro, N. M., have been closed down owing to the low price of silver, the difficulty of procuring Mexican ores, the low charges of treatment of ore and the coal strike.

HARRY DOUBLEDAY, one of the owners of the Gold Note mine in Kennedy, has returned to Winnemucca from San Francisco, where he came with a carload of ore to have worked. He is well satisfied with the results.

THE little town of Mogollon, in the Mogollon mining camp, 80 miles northwest of Silver City, N. M., was almost destroyed by fire last Sunday, only two business houses left standing. The loss is estimated at $75,000.

ALVINZA HAYWARD, Superintendent Lane of the Utica mine and Mr. Cross, administrator of the Hobart estate, have bonded the Gover mine on a ninety days' trial, and the *Record* says work will be commenced soon.

THE water is too high for the use of placer machines at the San Juan placers. With rockers men are taking out from $3 to $6 per day; one man took out $76 in 12 days. The ground is staked for 50 miles along the San Juan river.

THE mining property reported to be bought by Jim Wardner is the Imperial mine, mill site and water right in Kennedy district, Humboldt county, Nevada. He must have a mill of at least ten stamps in operation by September 22.

THE Penrose mine in Leadville carbonate district is again in operation with a large force of men, who had been laid off while repairs were under way. Since it started up two years ago the shipments from the Penrose have been simply enormous, some months running as high as 4000 tons.

SUPERINTENDENT COX and party of eighteen persons are at Cinnabar, Trinity Co., to reopen the Altoona quicksilver mine, situated in the northeastern part of the county. This property has been in litigation for a number of years, the suit having been decided last year in favor of the present company.

A GANG in this city are turning out counterfeit half dollars, made of pure coin silver. The silver in a genuine half dollar, measured by the gold standard, is worth twenty-four cents; it weighs 900 grains fine; the counterfeit weighs 825. On each piece the profit is twenty-six cents, and till caught the trade is a thriving one.

MANY miners who have been waiting for work at Basin, Mont., have gone into the hills to work on placer mines. All report that they are doing well, especially during the high water. Winters and Brown are taking out considerable gold on the headwaters of Basin creek and they expect to clean up $10,000 for the season's work.

EX-SENATOR H. A. W. TABOR of Colorado has gone to the Vulture mine. This famous property has already produced $7,000,000, and for the past three years was leased and but 10 stamps were running. The lease has now expired and Tabor says the mine will be worked extensively when the Santa Fe, Prescott and Phœnix Railroad approaches nearer.

THE Loomiston *Journal* says that at Conconully a vast placer deposit exists which can be easily worked by a hydraulic process of moderate expense. "Graveyard Flat," a bank from 100 to 200 feet high, commencing a mile south of town and continuing for three miles, has a bank on which a shaft has been sunk 55 feet. Ten feet below the surface occurs a stratum of colored sand and gravel which continues down for nearly 14 feet. Panning from any portion of this immense stratum, the gravel has averaged 25 cents per pan, or $25 per yard. This is a good sized story, but may be true.

THE Baker City, Or., *Democrat* says: There is a certain class of miners to whom rioting and fighting is more congenial than work. Many a good man has pounded a hammer on the same shift with such men, and felt all the time that a rule which gave them the same wages he earned was a damnable rule. Hasn't every decent miner had the same experience?

THE loss occasioned by the four months' strike at Cripple Creek, Col., is figured this way: Loss to labor, $285,000; loss to merchants, $60,000; loss to freight, $35,000; loss to dividends, $200,000; to which add the cost to El Paso county in furnishing deputies, etc., $150,000, and cost to the State in calling out the militia, $150,000, making a total of nearly $1,000,000.

REPORT comes from Osceola to the White Pine *News* that the Cumberland and Osceola Gold Mining Company's mill has been shut down and that the cyanide process is not satisfactory there. Had the rock been crushed finer and afterward passed over plates a success would have been scored. Fine bodies of rich gold rock are at present exposed in the company's mines.

DURING June there were coined at the U. S. Mint in this city $1,365,000 in 20's, $150,000 in half dollars, and $84,205 in quarters. During the fiscal year ending June 30 the coinage at the San Francisco Mint aggregated in value $24,190,496. Of this amount $20,878,500 was in 20's. During the forty years the Mint has been in operation the aggregate value of the coinage has been $1,000,066,389, of which $866,100,907 was in gold and $133,965,482 in silver.

PROSPECTORS here from Mariposa claim that the company owning the town site and land grant have not thrown it open. They say that the company will not allow wages to any one who finds paying claims, and that no placer mining is allowed within the limits of the grant. However, there is plenty of good mining ground in Mariposa outside of the grant, which bears about the same relation to Mariposa county that the whole county does to the mining area of the State.

ON the occasion of the recent great gale in north-eastern Washington a body of men engaged in placer mining were encamped in a dry gulch close to Five-mile creek in the Kootenai country. During the night the creek, swollen to enormous proportions, changed its course and swept through the gulch where the men were sleeping. Several of them reached dry land in safety, but three were not so fortunate and were carried away by the flood and drowned. The names of the victims were Raynor, Stewart and Metcalfe. The bodies were recovered and buried.

IN recent bromine tests at Denver upon thirty tons of iron sulphide concentrates from the Homestake mill in South Dakota, it is reported the extraction exceeded 97 per cent of the assay value. The company has decided to put up a bromine plant. The mills of the company turn out 60 to 75 tons of concentrates per day, which have hitherto been shipped to smelters. One or two tons of the concentrates were roasted with a Bruckner cylinder at the experimental plant; the remainder was roasted in the Pierce automatic furnace at the Argo works at a cost of 80 cents per ton. Under the old methods this roasting it is said would have cost $2 per ton.

AT a depth of 2000 feet the coal miners at Newcastle, Wash., recently came across some curious specimens. One was a piece of wood, petrified until it took on much the appearance of a piece of half-formed coal, but the annular layers are as well formed and as clearly defined as when they were growing. On either end of the piece of wood was an in rustation of a quartz-like character, beautifully white and sparkling, that looked like a coating of frost about an air hole. Near by were some pieces of coal formation, probably some pieces of wood further along in their transformation, and imbedded in them were several pieces of rosin as clear as amber and pretty as ambergris.

A TELEGRAM from Golden, New Mexico, says: It may sound like a fairy tale, but it is a fact nevertheless, that since the recent heavy rains in this section many nuggets and wires of gold have been uncovered and exposed to view, and numerous finds have been reported of pieces valued at from 25 cents to $1 on the hillsides in this little village. The volume of water rising through the arroyas has washed down the placer gold in such quantities that a sluice box placed in one of the small gulches in the very center of this town by Wm. White has become quite a curiosity as well as a paying investment. Mr. White cleaned up $4 of the "root of evil" after two hours' run of gravel through his box, showing an average of at least $2 per yard.

S. B. ROBBINS is down from the Alaska gold fields. "Last year was a very hard one," said Mr. Robbins, "particularly on those who went up there with barely enough to live on. Over 400 men crossed into the Yukon basin, some equipped with only a single blanket and enough food to last them a few days. The wages are a half ounce—about $8—a day, but there were two men for every job in sight. Every man who goes into the Yukon country should have at least $350 to $400. That is enough to carry him through for a year. He can then winter in the main basin and be at once prepared to commence work when the spring opens. Four of my friends during the past season cleaned up $90,000, but their luck was exceptional. There is room for 100,000 men in Alaska, but they must go there prepared to spend at least four months of the year in idleness. If they strike the country at the right time they can earn good wages at steady employment. I would caution all intending to go there to think well of what they may be called upon to encounter."

Personal.

PROF. R. A. F. PENROSE is inspecting the Cochiti district, N. M.

SUPT. WEYMOUTH of the Leonard mine has taken charge.

JAS. RULE has been at the Lone Star mine during the week.

WILLARD B. FARWELL, a well-known mining man, has applied to the Superior Court to be declared an insolvent debtor. His liabilities foot up $70,281.13. He has no assets beyond 14,990 shares of the stock of the Alvarado Artesian Water Company, inventoried as of no value.

Clipped and Condensed.

UNION PACIFIC stock is down to 13. Thirteen years ago it sold at 131.

PRENDERGAST, Carter Harrison's assassin, has been condemned to hang next Friday.

IT is estimated that the loss occasioned by the fifty days' strike of the coal miners will aggregate $20,000,000.

THE official existence of the San Francisco Midsummer fair terminated on the 4th. The total number of admissions was 2,219,236.

THE Denver *News* offers a reward of $1500, in sums of $250, for each arrest and conviction of the perpetrators of the assault upon General Tarsney.

THE Williams Palace Car Company, capitalized at $3,000,000, will begin the construction of cars at St. Joseph, Mo., to compete with the Pullman Company.

COMPARING prices to-day with those of a year ago, it is noted that they are less by 15 per cent for silver per fine ounce, 20 per cent for steel rails, 20 per cent for wheat, 31 per cent for mess pork and 20 per cent for wool in the American markets.

BY a majority of five the tariff bill passed the United States Senate last Tuesday. It now goes to the House, where it will not be concurred in. A conference committee will be appointed, and next month the bill still further modified may get through both houses.

LAST Sunday morning a stick of giant powder was placed on a stove in the Osboru Hill mines boarding house near Grass Valley. The top of the stove was blown off, the kitchen unroofed, crockery smashed, and the doors blown off the sleeping room in which Captain Gamble, steward of the boarding house, and three Chinamen were sleeping. The perpetrator had walked into the kitchen, and, after placing the giant powder on the stove, attached thirty feet of fuse and set a match to it. The mine will not be closed. President Grayson says it is the work of outsiders and the house will be rebuilt.

REGARDING the Pullman Company, which is one of the causes of the present trouble, the company's original capitalization was $1,000,000. In 1884 it had been increased to $16,000,000, and now it is $30,000,000. The miles of track covered by Pullman contract are 126,975. The income of the company in '93 was $13,414,708.92. The employes on the pay rolls at Pullman numbered 5565, their average yearly wages $613. Including the operating department, of which the employes are in a great measure paid by gratuities, the number of employes was swelled to 14,635 and the total of wages to $7,751,644.32. The town of Pullman has something over 12,000 people.

A RIOT is reported in the Cœur d'Alenes. A Boise dispatch says 100 men, masked and armed, have surrounded the Gem mine and mill, killed the blacksmith in the employ of the company there, captured Superintendent Neill, the foreman and others, and sent them across the divide into Montana. Troops have been called for, as a serious outbreak is feared. Superintendent Bradley of the Bunker Hill and Sullivan mines of Wardner has wired Governor McConnell that his men had been ordered to quit work, and unless they did he feared an attack would be made on that mine and mill. A. L. Gross of Spokane sent an appeal to Governor McConnell for troops to restore order. The Governor will go to the scene of action in person in case active hostilities are declared.

THE President's tariff bill has finally got out of the hands of the Senate. Of it Senator Perkins says: "While, of course, I do not approve the bill as a whole, I feel gratified that California has fared so well in it as it is passed by the Senate. Quicksilver, borax and currants are well protected. Lumber on the free list will hurt our lumber industries some; we have the bonded period extended on brandy, which will help us very much, and our fruit interests are well protected. There was another thing which I am more than pleased with. There was in the bill as it passed the House a provision for putting all machinery for vessels which ply in foreign trades, such as capstans, etc., on the free list. This would have been a great loss to our iron works, as last year we built 125 steam schooners. We quietly got the committee to restore the duty on these articles. In the exemption of savings banks from the income tax we also gained a victory. I think the House will concur in this bill and that it will become a law substantially as it now stands."

RECENTLY the Pullman Car Co. notified their employes at Pullman, Illinois, that there would be a reduction in their wages. Mr. Pullman gave $100,000 to his church and the company declared a quarterly two per cent dividend on $30,000,000 capital. The employes struck. The American Railway Union, a new labor organization, took up the labor trouble between the Pullman Company and its employes, and refused to handle any railway trains that contained Pullman cars. They did not decline to handle mail or passenger cars, but would not work in any way in handling or forwarding a train that contained a Pullman car. They "boycotted" those cars. The trouble began at Chicago. It was immediately transferred to this coast by the refusal of the Southern Pacific Railway Company to move any mail or passenger train that ordinarily would have a Pullman car attached to it unless that car was in the train. That occasioned an immediate deadlock and paralyzed all ordinary traffic. The trouble, which began June 26th, spread over every railway in this country west of Pittsburg, centralizing in this State at Sacramento and Los Angeles tying up the Southern Pacific and Santa Fe and culminating in calling out the U. S. troops last Monday. The State militia, several companies of which went to Sacramento, declined to take final measures in quelling the crowd in that city. The regular troops are in camp at the Los Angeles depot. All railroad points west of Pittsburg are in partial control of the A. R. U., and in this State the Southern Pacific is paralyzed. The conflict is now between the 250,000 who decline to work and the United States Gov't. Debs, the leader of the railway employes, an Alsatian, and a resident of Chicago, is in receipt of an injunction from Atty-Gen'l Olney, and of a citation from Federal Judge Ross to appear in Los Angeles. At this writing the situation is grave and bloodshed apparently impossible to prevent. The strike is the greatest of all the great railway strikes in the history of the country; it means more to the country than any former strike, and has already occasioned a loss of millions. It furnishes an unanswerable argument against the refunding of the Southern Pacific Railway debt and in favor of such governmental control as shall prevent a repetition of such costly folly.

California Borax Mines.

Thongh every now and then reports come from the desert of rich finds of gold and silver, yet the greatest indnstry of Death Valley and the desert is the mining and working of borax. Tweuty years ago borax was first discovered in California west of the Slate range, seventy-eight miles from Mojave, the discoverer, Jno. W. Searles, forming a company known as the San Bernardino Borax Mining Company, erected works which have been in constant operation ever since.

The borax iu the crude state forms in a crnst over the marsh. This crnst is removed, hanled to the works and placed in solution in immense tanks heated by steam. After allowing the solution to settle, it is drawn off iuto cement vats, where it is allowed to crystallize. This operation is again repeated, wheu the borax is ready to be sacked and shipped to market. After the removal of the borax from the marsh, erystals of tincal again begin to form, which are worked bnt once, when they are iu a salable couditiou. Iu order to facilitate this operation, water from the marsh is pnmped into large tauks, in which the tincal forms.

These works are models of mechanical construction, and are the best equipped on the desert. To the uninitiated borax working is bnt a repetition of boiling, settling and crystallizing. The fuel nsed is crnde petrolenm, which is hauled in huge tanks from Mojave.

The teams nsed in the transportation of the refined prodnct are cnriosities in their way—a wonder to the tenderfoot and a snrprise to the teamster. As these wagons are the greatest in existence, carry the heaviest loads and are seen no other place, a description is in order. The hind wheels are seven feet in diameter, front wheels five feet; hnbs, eighteen inches in diameter by twenty-two inches in length; tires, six inches wide and an inch thick; steel axles, three and one-half inches in diameter; bed, sixteen feet long, fonr feet wide and six feet deep. Each wagon weighs abont eight thonsand ponnds, and is capable of carrying 20,000 pounds at a load. Two wagons loaded with borax and an oil tank on a third wagon, completes the train hanled by the borax team. The team consists of eighteen mules and two horses—twenty animals in all, which are driven with a bell eord, used as a jerk line. A carload (40,000 ponnds) of borax is hauled each trip from the works to Mojave, and a tank of oil and two loads are hanled on the return trip.

It takes eight days to make the trip, and in nearly twenty years not a trip has been missed. Stations at which water can be had, and where feed is stored, have been erected for the borax teams to put np. The borax company has done mnch to assist in the development of the desert, as water is furnished free of charge at all their stations.

From the borax mine, twelve miles from Daggett, wagons of the same style and teams similar in make-up are used by the borax company.

Not all the borax of Death Valley and the desert is fonnd in marshes, and all the marshes, while having the same appearanee, do not contain borax.

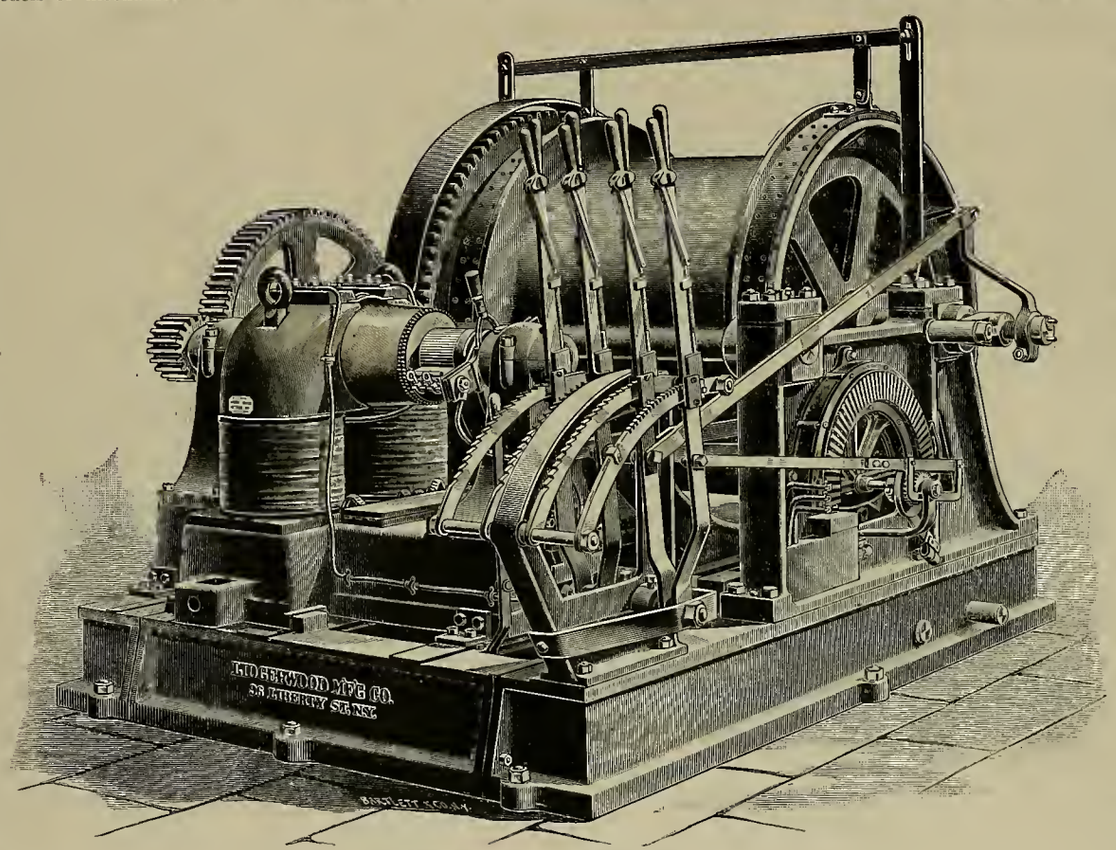
In Furnace Creek canyon of the Funeral mountains, and in the Death Valley marsh, borax is found in the shape of eotton balls, while in the San Bernardino Company's marsh none of these are found. The eotton balls are borate of lime and are scientifically known as nrexite. On taking them from the gronnd they can be pnlverized easily, bnt after exposure to the air they become very dry and hard. They become so hard that it is necessary to put them through a crnsher.

For months after the discovery of borax hundreds of prospectors braved the terrors of Death Valley, and many left their bones to bleach in that terrible sink-hole. Borax was searched for in nnheard-of localities, bnt it was only known to exist in marshes and beds of old lakes. It was not nntil the discovery of silver in the Calico monntains that borax was known to exist in deposits or veins. A miner, more cnrions than his fellows, had a piece of white-looking rock assayed, and made the wonderfnl discovery that hnndreds of prospectors had traveled over a vein of boracic acid more valuable than any marsh then knowu. This was a set-back to all preconceived notions of borax mining, and the snpposed-to-be valneless white rock of the Calico monntains became suddenly valuable. This is only another case of where the valnes at home were overlooked for the mnch-talked-of treasnres of a far-off land. The deposit at Calico is owned by the Pacific Coast Borax Company, and the prodnct is shipped to their works at Alameda for reduction.

Another and larger deposit of the same class was fouud at Monte Blanco, in a branch of Furnace Creek canyon, bnt its great distauce from a railroad made the working of it an impossibility.

In Death Valley are the rotting remuants of two borax works—institutions which promised, for a time, to make their owners rich. With a fall in the price of borax and the establishment of more accessible rivals, abandonment was forced npou the owners. The works north of Furnace Creek, which were erected to ntilize the product of Winter's discovery, elosed in 1888, after a rnn of five years. The Eagle works, erected at a marsh belonging to a Frenchman named Daunet, have also been closed down for several years.

Throughout all this couutry, with the exception of Death Valley, may be found the stakes of the railroad snrveyor, and several practical rontes for a railroad have been fonnd, though none have yet been decided upon. At the time of the discovery of borx in California, the wholesale price was 50 cents a pound. At present it is worth about 8 cents. Over 20,000 tons are nsed annnally, about one-third of which is produced in the United States.



FRICTION DRUM ELECTRIC HOIST.

Friction-Drum Electric Hoists.

On this page is shown a stationary hoist fitted with friction drnm, of a type which has been successful in mining operations. The bed-plate connections and controlling devices are of special design for electric power nse. The motive power is farnished by a standard Thomson-Houston motor. A speed reduction from the motor armature to the drum is accomplished by one intermediate shaft with proper gears and pinions. The drnm is mounted on a sleeve and is thrown into action with the large gear by a powerful friction elutch. Its speed, when running independently, is governed in this case by two hand brakes whieh exteud around nearly the entire circnmference of the drnm; nsnally only one is nsed. The hoist is equipped with five controlling levers, as shown in the illnstration. One operates the rheostat contact, one the drnm clutch, two are brake levers, which are entirely independent of each other, aud the last throws the reversing switch, giving the drnm, when thrown into action with the motor, positive motion in either direction.

One of the many advantages of the electric system for nnderground work is the ease with which the locomotive may be helped out where an incline occurs in the hanlage way. This is accomplished by means of stationary electric hoists operated on the same circnit as the locomotive. Their nse makes possible the employment of mnch smaller locomotives than would otherwise be necessary.

Fifty Millions in Silver.

The hnge vanlt at the mint, known as vanlt C, in which has been sealed np for nearly fonr years 50,000,000 of standard silver dollars, was opened a few days ago, and the long and laborious task of counting this big amount of mouey was beguu. As the occasion was deemed one of importance says the Philadelphia *Times*, there was observed some little formality. Dr. Caleb Whitehead had come on from Washington to represent the mint bnreau; Frank Sartori represented Superintendent Townsend, and W. L. Bosbyshell, Col. Bosbyshell's son, represeuted the former superintendent. William E. Morgan, United States Treasury examiner, was also present. United States Treasnrer Daniel N. Morgau, who, with his son, happened to be in this city, and accompanied by Major Worman, witnessed the breaking of the seal and afterward made a tour of inspection of the mint.

Maj. C. H. Townsend, cashier of the mint, having been given the combination of the vanlt, proceeded to open the door. This was easily accomplished, but when the inner door was reached some difficnlty was experienced, as even after the combination lock was manipulated the door refused to open, the bolts from long disnse sticking fast.

This was soou overcome, however, entrauce was finally effected and the assembled officials stepped within the inclosnre where lay piled up millions. On the inside door, fastened by sealing wax, was a sheet of foolscap paper containing the statement that $33,000,000 had been placed there on Febrnary 7, 1890, with Major Meline, of the treasnry; B. F. Butler, of the mint bnreau, and James C. Eyster, of the mint, present, and that further, $17,000,000 more had been sealed np on May 26, 1891.

The vault emitted a damp, musty odor when opened. Under the glare of the electric light the great wealth of stored silver was visible. There it lay in bags jnst as it had been placed. There were 50,000 bags, each coutaining $1,000 in shining eoiu. These bags were piled np one on top of the other, the topmost almost reaching the arched eeiling of the vault, nearly nine feet high. The whole mass had been arranged in different staeks. The first stack was thirteen bags high and eight across. Jnst in the rear of this was a second stack, while still fnrther back loomed np a third. This, thongh, represents only one section of the vault. Altogether there are nine. The weight of this great amonnt of silver is 2,850,000 ponnds avoirdnpois, and the tremendous pressure of the npper bags upon the lower had caused a nnmber of the latter to bnrst, causing their glistening contents to spread out npon the floor.

A Western Nevada Mining Camp.

Silver City is a little mining camp in Lyon county, says the Dayton *Times*, which is producing more gold thau all the other camps in the State combined, and yet it is a quiet little place, seldom heard of outside of the State. Prospectors, mine owners and

lessees are taking out ore all the time, and having monthly cleanups that range from $1000 to $15,000 for the work of two to four men. Last week the lessees of a certain mine cleaned up in the neighborhood of $20,000 from 35 tons of ore, taken out and sorted by three men in the space of five weeks. While this is an exceptionally good streak of luck, many others are making comfortable stakes of good wages out of their little mines. If the camp was a thousand miles from habitation—in Africa, Alaska, or some remote portion of the globe—men would flock to it by hundreds, and capitalists would lend aid in developing the mines, and such yields as were made last week would be heralded to the world by lengthy cablegrams, etc. But Silver City is in Nevada. It is a quiet little place; business men are doing well there, and some mine owners are getting rich, while all are making good wages, at least.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER VI.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

We are informed by historians that coal was burned as a fuel in the 9th century. Æneas Sylvius visited Britain about the 15th century, and in his writings may be found an account of poor people in Scotland "begging and receiving for their alms pieces of stone which they took with content. They burned these stones instead of wood, of which their country is destitute."

In the year 1232 Henry III granted license to dig coals for 100 pounds per annum.

Boetius, a Scot, in a history of his native land written in the beginning of the 16th century, says: "There are black stones digged out of the ground which are also very good for firing, and such is the intolerable heat, that they resolve and melt iron, and therefore are very profitable for smiths and such artificers as deal with other metals."

Dud Dudley (Dud Dudley's Metallum Martis, or Iron Made With Pit Coale, Sea Coale, &c., and With the Same Fuel to Melt and Fine Imperfect Mettals and Refine Perfect Mettals. London, 1665) shows that in his time the forests of England had been to a great extent destroyed in the manufacture of iron. The Parliament of Queen Elizabeth made stringent laws to protect the forests. Dudley invented a process for the smelting of iron with pit coal, and succeeded after others had failed. He refers to the destruction of of the forests as follows (Fol. 6):

"Now let me shew some Reasous that induced me to undertake these Inventions after many failings of others, well kuowiug that withiu Teu miles of Dudley Castle there be 20,000 Smiths of all sorts and many Irou works at that time within the Circle decayed for want of Wood—yet formerly a mighty Woodland Country."

In 1611 King James issued a patent to Simon Sturtevant to manufacture iron with "sea cole" or "pit eole" for 31 years. Sturtevant failing to accomplish what he had undertaken, the King cancelled the patent and issued a new one to John Roveuson, who also failed. A patent was then granted to Gumbleton, who erected extensive works at Lambeth and likewise failed. In 1619 Dudley was manager of his father's foundries in Worcestershire, but wood and charcoal being scarce and hard to be obtained, while coal was abundant, he made alterations in one of his furnaces, and with coal made good iron with success, but at first only in small quantity.

Sir John Pettus (Fleta Minor, the Laws of Art and Nature in Kuowing, Judging, Assaying, Fining, Refining and Enlarging the Bodies of Confined Metals. London, 1683) in his "words metallic," thus refers to coal: * * * "but these are not useful to metals. 'Tis true many have attempted to chark them and make cinders of them, to be used for metals when wood is scarce, but I have not yet heard of any certain success therein (though I wish it)."

William Pryce (Mineralogia Cornubiensis, 1778, Fol. 282) refers to the destruction of the forests of Cornwall to supply the metallurgical furnaces in tin smelting—leading to the introduction of coal. * * * "When we behold a wide and barren waste extending itself throughout the whole mining district of this county, without a tree to intercept the fury of the winds, we have no reason to commend the prudence of our aucestors in thus depriving their demesne of its necessary shelter. "The scarcity and increasiug cost of wood raised the price of tiu.

* * * "Necessity at last suggested the introduction of pit coal for the smelting of tin ore, and, among others, to Sir Bevil Granville of Stow, in this county, who made several experiments, though without success; neither did the effectual smelting of tin ore with pit coal take place till the second year of Queen Anue, when a Mr. Liddell, with whom a noted chemist, Mr. Moult, was concerned, obtained Her Majesty's patent for smelting black tin with fossil coal in iron furnaces. The invention of reverberatory furnaces built of brick, stone, sand, lime and clay soon followed this discovery, the form of which being simple has admitted little improvement to the present time."

In the chemical works of Casper Neuman, London, 1759), Fol. 246, may be found the following: "Pit coal, an excellent fuel for common uses, is for many purposes unfit. It cannot be employed for the running down of iron or other ores which are smelted in contact with the fuel; not, as some suppose, that the fossil coal does not give sufficient heat, but from its sulphurous substance corroding and scorifying the metal or rendering it brittle, when vegetable coals supply only the simple inflammable principle necessary for receiving the metal into its metallic form; * * * nor are fossil coals proper for fusion in crucibles, as they melt and cake about the vessel and endanger its cracking. The glass makers in England have been greatly depressed by this quality of pit coal and the scarcity of wood, insomuch as to proffer a reward of ten thousand pounds to those who discover a composition for pots that should best stand pit coal fires." This difficulty was removed when the art of making coke was invented and perfected.

Probably the first mention of coal in America may be found in an old book printed in London in 1729: (An Attempt Toward a Natural History of the Fossils of England, by Dr. J. Woodward; (Addition to the Catalogue of the Foreign Native Fossils. Bituminosa, folio 12). A specimen of coal in that remarkable collection is described as having been brought by an Indian out of the inner part of the country of New England.

Copper Mining.

The copper industry of the United States has for the past several years preseuted the anomaly of a steadily increasing production and falling prices, until at the present time copper is selling at a lower figure than ever before iu the history of the industry. The decline has been more precipitate during the past year, due to the general depression in business, which while it has greatly curtailed consumption has had no effect in lessening production, until at the present writing large stocks are held by producers and in the hands of warchousemen, exports have fallen off considerably, and manufacturers are fairly well supplied for the summer months by the receut sales of 15,000,000 pounds Lake at 9 cents. Since these sales were made private advices from New York record a still lower figure for Lake copper, viz: 8.80. Arizona copper is nominally 8 cents, but there is scarcely auy demand for this class of copper.

Up to the present time says the *Silver Belt*, producers have been enabled to meet the shrinkage of values by improved processes of smeltiug and refining and economies carried into almost every branch of the industry, but the limit in this directiou has about been reached, and there are now very few mines in the United States which can operate at a profit and some that are runuing at a loss. The present prices if contiuued for any length of time must result in the closing down of important mines and a consequent curtailing of production. Companies can not continue to run at a loss or exhaust their miues, for in time they will be worked out and costly plants will then become practically valueless. Some of the Michigan and Montana mines are best able to withstand the present depressiou. The Calumet & Hecla is still the most valuable copper mine iu the world, competent engineers estimating that the company can lay copper down in New York at 6 cents per pound, and that the vast ore bodies in the mine are sufficient to last for fifty years.

It is doubtful if any of the copper mines in Arizona can now be operated without loss, except the Copper Queen, and possibly the United Verde, and the small margin of profit remaining to them makes continued production a matter of questionable expediency. Of course no one expects the present low price of copper to prevail longer thau a few months, and should the business of the couutry revive perceptibly, the price of copper would respond to the quickened demand and consumption, and new life would be instilled iuto the industry.

It is not probable that the price of copper will ever again rule as high as in former years. As before suggested, the efforts of mine owners are concentrated iu the direction of more economical and larger production and while the prevailing depression may give a temporary check to expansion, yet copper will be amoug the first industries to feel the benefits of returniug prosperity. A moderately low price for copper (10 to 11 cents) has the advantage of stimulating cousumption, enlarging its field of usefulness, aud enabliug its substitution for less desirable metals in the mauufactures.

Globe, while temporarily haudicapped by the excessive cost of transportation, is one of the greatest copper districts in the Southwest. Her ore deposits are rich and extensive and as yet scarcely infringed upon. The process of smelting is the simplest and least expensive, and the copper when it comes from the furnace is so pure as to require no refining and goes into the market as a good merchantable copper. All that is required to give life to copper mining in Globe district is cheaper rates of freight on coke and copper which seem assured at no distant date by the completion of the Gila Valley, Globe and Northern railroad.

Mines on the Lower Colorado River.

Taylor D. Macleod in Yuma *Times*.

Picacho District.—One mile above the Azure King, on the California side of the Colorado, is the ten-stamp mill that pounded out much gold in early days. Three miles westerly over a good "wash" wagon road, clustered near the base of Chimney peak, or Picacho, are the mines. These mines produced good pay from several rich and extensive chambers, but are now holding a low grade ore, though specially free in gold. Doubtless systematic exploiting by a thoroughly competent superintendent, with "no strings on him," would result in the discovery of like extent and value. There's the rub! A self-respecting, competent mining man does not care to exploit "has been" mines through orders from parlor miners in New York, who don't know the strike of a ledge from a railroad strike. That there is a future for the quartz miues of Picacho district the writer has never doubted.

An English company, at great expense, has erected a pumping plant at the river to ground sluice for the gold that is certainly of good value in the gulches and impregnating the gravel mesas of this district. The success of the venture will hinge on the management of the enterprise in its inception. If they have not secured the services of some emiuently qualified practical hydraulic engineer, it may be written down as a failure. There is too much expense, too many leaks, in this method of lifting for miles the volume of water required in placer mining to "monkey" with any experimental measures. In all probability it will ultimately pay—provided our English cousins do not weary of assessments.

Silver District.—Three miles yet to the north, and 50 miles by river to Yuma, and 30 miles by trail ou the California side, we find the village of Norton's Landiug, maiutained solely and alone from the produce of the mines of Silver district.

Norton's Landiug has a postoffice and the general supply store of Levy & Caseres, a public school of 25 pupils and the largest settlement between Yuma and the Needles on the Colorado river. The mines are five miles westerly over good wagon roads. The veins of this district are remarkable for strength and coutiuuity. There is a system of four parallel ore channels, cropping boldly with an average width of 20 feet between walls, and a northwest and southeast trend, clearly defined, with uubroken croppings, three to five miles in length. In the southeastern part of the district the ledges are iu a contact of porphyry and granite, where the "soft" or smelting ores are had. The granite pinches out and the porphyry gives way to trachyte as the ledges reach north and the ore changes to a "dry," free milling silver chloride, with not two per cent of lead, as shown in the Clip, Rooster and New Deal claims—an excellent illustration of the influence the inclosiug walls have on the kind of ore deposited. The general country formation is porphyry.

New Laws For Mercur.

At a miners' meeting, held at Mercur, Utah, last week, the old by-laws of the district were repealed, and those drawn up by a committee appointed for that purpose adopted. Sections 9 and 10 were changed as follows:

"SECTION 9—Every locator of a mining claim in this district shall, within thirty days of the date of his location, move at least 200 cubic feet of earth or rock, if the same can be worked to good advantage by picking, and where the work must be doue by blasting at least 100 cubic feet must be moved within thirty days, and within thirty-five days from the date of discovery, he or they must file their location uotice with the District Recorder.

"SEC. 10—Every locator of a mining claim in this district must mark his claim at the point of discovery with a substantial monument or post, plainly marked with the name of the claim, the name or names of the locators, the direction and uumber of feet claimed each way, and also with a substantial and plainly marked stake or mouument at each eorner and at each certain end liue."

Senator Stewart's bill, which receutly passed the Senate, reducing the assessmeut work on mining claims to $50, was vigorously condemned in a resolution presented by Captain George Ryan, and it was unanimously adopted.

PLACER MINING IN ALASKA.

Continued from first page.

their veins. Those who have been there themselves generally have a larger story to tell.

Prospectors Going up the River.—Five men from Fresno went out in the Bertha last Sunday, intending to connect with the river steamer at St. Michaels and reach the mines some time in July. They carry a good outfit and intend to return in the fall of '97. This is much the easier way to reach the mines, but it is impossible to get there by next steamer earlier than August and the working season lasts from May until October. For this reason it is customary to go in over the pass and down the river and to go in March or April so as to cross the streams and canyons while the snow bridges are hard, and reach the diggings as soon as the frost begins to come out of the ground. All accounts agree that it does freeze there, sure enough, to the depth of about eight feet. In ground that is poorly drained and covered with moss only a little of the surface thaws out during the summer. There is a great extent of this level moss-covered country called "tundra." Fortunately moss is the favorite food of the moose and reindeer and either is a very serviceable animal when domesticated. They tell of reindeers hauling sledges one hundred miles in a day.

But not all the Yukon country is a tundra for there are rich pastures to be found, and on the third attempt Mr. McQuestin raised a very good crop of potatoes at Forty-mile Creek. It won't be long before somebody will find a way to supply the town with milk, if not from cattle then from domesticating some of the native animals.

A Strange Way to Kill Big Game.—Lieut. Schwatka publishes a thrilling illustration of Indians destroying a herd of moose while swimming the Yukon by jumping on their backs in the water and cutting their throats with butcher knives.

One man started from Juneau for the Yukon with a twenty-seven dollar outfit. It was impossible for him to patronize the Chilcat monopoly on that capital.

In such cases they have a way of organizing a sort of private Traffic Association by building a sled like one illustrated in the picture of the miner's tent below, and then packing the load a little at a time up the steepest places as we see in the picture at the right of the stove.

Mr. Peterson helped them haul their sleds up the hard places this year at 50 cents per cwt. by means of a pulley block and twelve hundred feet of rope. His scheme was to load a sled with snow and make that pull up a load of goods, but he could not load on enough snow to balance them entirely.

We see he has drawn a home-made map of the route on the side of his tent and given to the lakes and rivers nickuames of his own. Perhaps this averages quite as well as the "parlor geography" referred to by Schwatka when speaking of those who fix the maps with rivers and mountains where they think they ought to be. It seems that there is a great deal of that kind of Alaskan geography. Mr. N. L. Berdau, of 12 Montgomery street, says that when on the first excursion with "The Queen" under Capt. Carroll they steamed for three days through channels in Prince of Wales Island, where it was laid down on the map as solid land and they found an archipelago.

In the excursions they visit the Treadwell and Silver Bow mines, the glaciers and the beautiful timbered islands of south eastern Alaska, in a climate not much colder than that of Washington.

In the picture on the first page we have a view from the deck of the Queen. Juneau is on the right and Douglas Island, with the great Treadwell quartz mine, on the left.

The Silver Bow is a hydraulic mine, about four miles back from Juneau. The timber that we see and the principal tree of southeastern Alaska is yellow cedar —a fine-grained, fragrant and very enduring wood that is often used by Chinese for box lumber and makes excellent ship timber.

Cook's Inlet, the Alaskan Peninsula and the Aleutian Islands are all very different from the Yukon basin or the Sitkan country.

A Country of Varied Conditions.—When you hear that Alaska is so level that miners must use the rocker because there is no way to dispose of the tailings, and again read of grand canyons, cascades, rapids, etc., it is fair to presume that it has hills and valleys like other countries instead of drawing a mental picture of the whole country as like that part described by the writer.

In looking over the hundreds of pictures of glaciers and icebergs in Capt. Carroll's album we should infer that Alaska was one vast field of ice.

When Lieut. Gurnee tells of crossing the Alaskan Peninsula, where rich grasses grew breast high over vast prairies, and others tell of cattle in fine condition that never saw a barn, we reason that the Japan current prevents the thermometer from getting fifty or sixty degrees below zero, as they say it sometimes does on the east side of the mountain range where St. Elias sits in majesty.

We want to know whether it is worth while to go to to tell "All about Alaska" as Goodall, Perkins & Co. do in their pamphlet.

It is too late to get in by the Chilcat route, and if we wait for the next steamer of the Alaska Commercial Co., we cannot get there before August nor expect much more than a month's work before the season closes. To get that month's work one must plan to stay through the winter, and expect to be practically idle for seven months. This letter from Mr. McQuestin is regarded at the U. S. Mint as authority regarding the output of '93. Probably similar data will be available for '94:

FORTY-MILE, Aug. 15, '93.

Mr. W. H. Dimond.—Dear Sir: I have just returned from inspecting the mines in this district.

And in compliance with your request I am able to give you a "fare" statement of the output this season.

40 Mile Creek	35 miners	$25,000
Nugget Gulch	3 "	1,500
Franklin Gulch	40 "	35,000

MINERS' TENT AT YUKON GOLD FIELD.

Miller Creek	80 "	100,000
Davis Creek	35 "	30,000
Rilker Gulch	3 "	4,000

There are about 50 more miners in the country prospecting. Miller Creek was struck last spring, a year ago. There are 50 claims of 500 feet each. Nineteen claims are working this summer. They are making from $850 to $1000 to the hand.

Toward the mouth the ground is from 15 to 25 feet to pay dirt, and very flat and more difficult to open up.

Gold Hill mine at Sanana station was not worked last summer, on account of not having the material to work with.

Yours truly, L. N. MCQUESTIN.

In addition to this $195,500, the Mint has reports from other parts of Alaska as follows:

Treadwell Mine	$779,782
Juneau	4,400
Apollo	48,000
Betel Mines	2,500
Small Quartz Mines	5,641
Total	$840,323
From Yukon Mines	195,500
Total from Alaska	$1,035,823

Mosquitoes en Masse.—Next to the 240-stamp mill at the Treadwell, the biggest Alaskan stories are of the mosquitoes on the Yukon. They are said to come in clouds to present their bills, and to crawl over one another, so that a mosquito bar is little protection. Even the great brown bears, such as one may see at Liebes' fur store on Post street, are so annoyed by their attacks upon their eyes and ears that they sometimes exhaust themselves in fighting them until they sink down blinded and discouraged to die in some marsh.

Native Races.—All accounts agree in representing native Alaskans as very susceptible to the evil influences awakened by contact with the rough element among frontiersmen, and equally responsive to industrial training directed by enlightened Christian philanthropy.

Rev. Wm. Duncan began his work in '57 with those who were very superstitious and degraded even for savages. They now have a thriving community of 300 to 500 people living in neat houses of their own building, and claiming to have the largest church in the world that was out of debt when finished. They own stock in the large cannery and in the store. They have sawmill, blacksmith shop, carpenter shop and other accessories of a thriving frontier town. Mr. Duncan was too busy in raising his pupils to a higher standard of living and of duty to give so much attention to dogmas as the authorities of the mother church thought essential, and a bishop was sent to manage his people. Trouble arising from this and from the title of their old home being vested in the church resulted in their removal to American territory and a special act which gave them practical ownership of Annette Island, where their homes may never be molested.

The Rev. Sheldon Jackson, who has charge of Presbyterian missions in Alaska, is very highly spoken of as a practical man in elevating the race by industrial schools and churches. He very strongly recommends the establishment of Government culture stations to test the agricultural possibilities of Alaska. His view is endorsed by Gov. Knapp in his able report to the Secretary of the Interior.

As this city is the natural base of supplies and our capitalists are doing the principal business there, we are as much interested in his very sensible suggestions as though the territory was a part of California.

The childlike nature of the natives is shown by their way of taking medicine. If good, they divide fairly among sick and well and eat it up forthwith.

If bad, they hide it from the doctor's sight.

Since the white population is only one in eight and the others are so incapable of managing public business, it is desirable that offices should be largely filled by appointment from among permanent residents who are qualified. It should never be necessary to go hundreds of miles from any settlement to reach a constable or justice.

A grade over the Chilcat Pass and a postal service to the Yukon are very much needed.

There should be a more satisfactory plan devised for both whites and natives to secure titles to homes. An efficient militia and a Governor's cutter are needed to secure the execution of the few laws existing. There should be a responsible commission to recommend the necessary action to bring order out of the present chaos.

Until better representation is provided it might be the placer miners on the Yukon, and cannot attempt well for such commission to have a voice in Congress in behalf of the territory—possibly through one of their number as delegate. Senators and Representatives from the Pacific States should do what they can in Congress to promote settlement in Alaska and thereby advance important business interests of their principal cities.

So long as we can extend our interests in a country that produces four dollars where it consumes one, we shall gain rapidly by the venture.

Just now San Franciscans feel that they need a new Nevada.

The Official Awards.

On the 1st inst., Frank McCoppin, chairman of the Awards Committee at the Midwinter Fair, announced the awards in the Department of Mechanic Arts. They are mainly as follows, the words "first," "second," "third" and "special" indicating the class of the award, and preceding the name of the article exhibited on which the award was made:

Dow Pump Works, first, triplex-plunger, mining; special, compound duplex pumps; first, speed and pressure governors; first, boiler feed pumps; first, duplex waterwork pumping engine; special, fire pumps.

American Balance Slide Valve Company, first, balance for slide valves.

John E. Doak, Stockton, Cal.; first, gas engine.

Risdon Iron Works, first, ball engine; second, Bryan mill; first, Webster feed water-heater; first, Johnston concentrator.

A. L. Fish, first, Buckeye engine.

Best Manufacturing Company, San Leandro, first, gas engine.

W. H. Ohmen, first, compound engine.

Golden State and Miners' Iron Works, first, differential governor; first, compound slide-valve Corliss; second, Thompson high-speed engine.

Hendy Machine Works, special, quartz mill, complete; first, griffin wheels; first, horse whim, ore feeder, etc.; first, hydraulic giants; first, Russell engine; first hydraulic gravel elevator; third, iron valves; third, valves for hydraulic pipe; third, engine and boiler fittings.

W. T. Garratt & Co., first, ship's pumps; first, wine pumps; first, Hooker pumps; first, Hall pumps; first, Fisher pump governor; second, double-acting pump for hand or power; special, general exhibit; special, Elde engine, with centrifugal pumps; second, fire hydrants; first, brass work; second, logging jacks; special, bells; first, iron-bodied globe-valves; first, water gate.

Commercial Machine Works, San Francisco, first, tire upsetter and welding machine.

Whitman & Barnes Manufacturing Company, third, twist drills.

Roberts, Royle & Co., second, silk looms.

Dewey Engraving Company, first, half-tone engravings.

Goodyear Machine Company, special, shoemaking machinery.

Liddell & Williams, San Francisco, first, sandblast machine.

Mette & Jenkins, Santa Cruz, second, blacksmiths' swedges.

A. E. Johnson, Carson, Nev., first, hand drill.

Dunham-Carrigau-Hayden Company, first, Kearney & Foot Company's files; first, Tahor indicator; first, augur bits; second, drop forgings; second, Coffin's planimeter; first, Hayes tube expander; first, boiler tubes, etc.; first, Converse patent lock joint system; first, Eddy gate valves; first, brass goods; second, fire hydrants; first, water meters; second, air valves; first, pop safety valves.

Novelty Sewing Machine Company, first, perforating and embroidery machinery.

Richards Lock Nut Company, San Francisco, first, lock nut.

Zan Bros. & Co., San Francisco, first, broom-making machine.

Plumas county, second, minerals.

Stanley & Bartlett, Napa county, first, magnesite.

Bishop & Vaughn, San Benito county, first, minerals, etc.

A. Blanc, Oakland, third, native antimony.

Trinity county, second, minerals.

Santa Cruz county, third, minerals.

Placer county, special, gold and minerals.

Ballard, Martin & Neville, Tuolumne county, first, gold quartz.

Tuolumne county, special, minerals.

El Dorado county, first, minerals.

Butte county, first, minerals.

New Almaden Quicksilver Mining Company, first, cinnabar.

Mariposa county, third, minerals.

Siskiyou county, third, minerals.

S. S. Taylor, Plumas county, second, minerals.

Shasta county, second, minerals.

Plumas county, first, gold.

Merrill Miller Mining Company, Montana, second, silver and lead ores.

Beattie & Vaughn, Montana, second, silver ore.

Glengary Mining Company, Butte, Montana, third, silver and copper ore.

Anaconda Mining Company, Montana, special, copper.

Golden Sunlight mine, Jefferson county, Mont., second, gold and copper.

Mrs. M. A. Comfort, Deer Lodge, Mont., first, crystallized silver.

J. Chauvin, Butte, Mont., first, minerals.

F. A. Wey, Butte, Mont., second, minerals.

Dr. A. H. Mitchell, Deer Lodge, Mont., second, minerals.

Silver Bow Columbia Association, Butte, Mont., first, copper shield.

Butte and Boston mine, Butte, Mont., second, copper.

Boston and Montana mine, second, silver and copper.

J. C. Savery, Cable, Mont., first, gold ore.

High Ore mine, Mont., second, silver and copper.

Drum Lummon mine, Mont., second, gold and silver.

J. A. Leggat, Butte, Mont., second, silver and copper.

Toledo mine, Madison county, Mont., third, silver and lead.

R. Mackintosh, Salt Lake, first, minerals, etc.

Utah Commission, special, minerals, etc.

Goldsmith mine, Butte, Mont., second, gold and silver.

E. G. Morrison, Eureka, Nev., first, minerals, etc.

Occidental Alkali Company, Hawthorne county, Nev., second, soda.

Nevada Salt and Borax Company, Rhodes, Nev., second, borax.

D Bonelli, Rioville, Nev., third, mica.

Joseph Grandelmeyer, Hamilton, Nev., third, minerals.

State of Nevada, special, minerals.

Mono county, second, minerals.

Standard Asphalt Company, special, asphalt.

H. B. Stow, Forbestown, first, gold.

California State Miners' Association, special, State mineral exhibit.

Charles R. Allen, first, coals.

Union Oil Company, first, crude petroleum; first, mineral distillates.

Sierra county, second, minerals.

J. & F. Kesseler, special, onyx.

Millis & Wiug, Lehi, U. T., third, onyx.

Inyo Marble Company, San Francisco, special, marble.

J. E. Caldwell, Valley Springs, Cal., first, gray marble.

San Francisco Slate Company, first, slate.

Campo Seco Building Stone Company, second, tufa stone.

Amador Marble Company, second, marble.

Sites Sandstone Company, Colusa county, first, sandstones.

Chil Bar Slate Company, Placerville, second, slate.

J. Strahle Slate Company, first, slate.

W. E. Lindsey, Carson, Nev., first, travertine; second, marble and sandstone.

Dr. T. Boyesen, Palace, second, serpentine marble.

E. W. Bennett, thire, metal polish.

Del Mining Co., Virginia, Nev., third, silicon.

Silex Mining Co., Hawthorne, Nev., third, aluminum luster.

Union Pressed Brick Co., first, terra cotta and brick.

Natural Mineral Soap Co., Elko, Nev., third, mineral soap.

Gladding, McBean & Co., first, terra cotta and brick.

A. Steiger & Sons, San Jose, Cal., first, terra cotta, etc.

Gilsonite Asphaltum Co., St. Louis, first, gilsonite.

Nephi Plaster Co., Nephi, Utah, second, plaster of Paris.

Wasatch Asphalt Co., Salt Lake, first, asphalt.

Anderson Pressed Brick Co., Ogden, Utah, third, pressed brick.

Salt Lake Pressed Brick Co., Salt Lake, second, pressed brick.

James Burke, Steamboat Springs, Nev., third, limestone.

Penn Chemical Works, Calaveras county, second, copper cement.

Standard Asphalt Company, Kern county, special, asphalt paving cement or refined asphalt.

Natural Mineral Water Company, Ogden, Utah, third, mineral water.

California Petroleum and Asphalt Company, first, asphalt and lubricating oils and compounds.

J. W. Searls, first, borax in glass jars.

Union Oil Company, California, first, refined asphalt.

State of Nevada, first, salts.

Alexander Wise, Nevada, first, native sulphur.

R. H. Curry, first, Geyser table water.

Sonoma county, third, minerals.

Penn Chemical Works, Calaveras county, Cal., first, copper ingots.

Morgan Mill, Empire, Nev., third, sulphate of copper.

Selby Smelting and Lead Company, special, lead ore and products, solder, block tin, shot.

C. Bell, Lovelocks, Nev., second, nickel and cobalt ore.

Mathison Smelting Company, San Francisco, special, antimony.

Lander Company, State of Nevada, second, antimony, ore.

E. G. Denniston, Plating Works, first, silver-plated copper, amalgam plates.

George E. Woodbury, first, concentrator.

J. B. Freeman, Los Angeles, second, dry gold separator.

Gold and Silver Extraction Company, Denver, Col., special, extraction process for gold.

A. Smith, Bodie, Cal., first, mining cage model.

Union Iron Works, first, Union ore crusher; first, hoisting engine; special, vertical compound engine; first, iron frame battery; second, McCully crusher.

F. A. Huntington, second, roller mill, etc.

William Keast, special, model mine in operation.

L. S. Manning, Oakland, first, car coupler.

California Fruit Transportation Company, first, fruit car.

Brame Manufacturing Company, Reno, Nev., third, wagon wrench and jack.

Premier Cycle Company, third, cycles.

Pope Manufacturing Company, first, cycles.

Studebaker Brothers, San Francisco, special, general display; first, phaeton, brougham and physician's buggy; second, Victoria and passenger trap; first, harness; second, aluminum wagon.

Fix & Lundell, third, cabriolet.

H. A. Smith, first, Lovell cycles.

O'Brien & Sons, first, brougham and top buggy; second, landau, Victoria and phaeton; third, Columbia trap; third, vehicle spring.

Stoddard & See, second, cycles.

C. W. Stein, first, carriage and wagon trimmings.

Fort Wayne Electric Company, first, arc dynamo; special, wood alternator; first, regulator for arc machine; second, arc lamp.

A. E. Johnson, Carson, Nev., second, telegraph instrument.

Portland Electric Works, Portland, Or., first, fire alarm system.

Paraffine Paint Company, San Francisco, first, P. & B. electrical compound.

Western Electric Company, special, general display; special, single and double arc lamps; special, decorative work, with incandescent lamps, electric tower; first, electric scenic theater; first, station appliances; first, D. C. arc machines; first, D. C. incandescent machines; first, motors; first, automatic commutator switch; second, primary batteries; second, telegraph instruments.

General Electric Company, special, general display; first, incandescent lamps; second, T. H. arc lamps; first, sixty-inch searchlight; first, station instruments; special, regulator for arc machines; first, railway generator; first, T. H. alternator; second, T. H. arc machine; first, three-phase system; first, motors; first, application of electricity for mining.

Standard Electric Company, Chicago (Ill.), special, arc lamps; first, regulator for arc dynamos; special, arc dynamos.

Book Notice.

BROWN'S ASSAYING.—Fifth edition: E. H. Sargent & Co., Chicago.

This is an old friend in a new garb, being the fifth edition of a book which has received wide endorsement from practical men. It is just what it purports to be—a manual of assaying, written in clear style, accurate in statement and plainly worded. This volume is an enlargement and an improvement on former editions, and has 133 illustrations. The price of the book is $2.50, and will be sent post paid from this office.

Electrolysis Neutralized.

Regarding electrolysis, the leakage from electric car rails to adjacent water and gas pipes, whereby they are punctured by small holes and the metal eaten away so as to render the pipes unsafe, it has been said that the remedy for this danger to gas and water systems, involving great peril in case of a conflagration and heavy cost every few years to replace the pipes, is a perfect short conductor for the return circuit. This can be done by bonding the electric car rails by welding the ends together, or making the bond with heavy copper wire, and also by putting cross sections of wire from rail to rail every 100 feet. Where rails are bonded by wire that is simply wrapped or coarsely soldered, they are supposed to be fairly protected from leakage. But this is not true, for the reason that in a short time the wire corrodes, as does the rail, and even the solder gives way, and then dirt and dust of the street, entering between the bond wire and the rail, soon break the connection or in time render it feeble. The more recent investigations by scientists, says an exchange, result in the conclusion that the bonding should be done by welding the wires to the rail or the rails to each other. To do this latter, after the rails are down, is of course necessary. As nearly every great need develops a means of supplying it, so in this case an apparatus has been devised for making the bond perfect by welding the ends of the rails together after they are placed in the roadbed.

This is done by electricity. The machine hangs on a crane so as to be easily and swiftly transported. On a small car are carried two motors, which operate emery wheels and polish the ends of the rails to a mirror-like surface, that the electrical union may be perfect. Electrical machinery is then operated, which it is unnecessary to describe, by which side and bottom lugs are welded, and plastic steel also fills the joint; so what is known as a butt weld is made, besides the welding of the lugs to the web of the rail. It requires about two minutes to complete a welding, as the necessary heat is so quickly produced.

The result is a better roadway, because all the joints being closed there is no pounding or jolting, but smooth running, and unnecessarily a longer lease of life is given to the rails. The current leakage is then stopped and the gas and water pipes are protected from electrolysis.

This new process is now adopted in Brooklyn, and the rails of all the electric roads are being bonded by the new process, and thus the danger from electrolysis is removed. To make assurances perfect, tie rods are put in from rail to rail at certain distances, so that if a joint breaks there will still be a shorter distance for the return current to travel than by departure through the soil to water and gas pipes.

Australia's Gold Fields.

Some big stories are current of the richness of the Coolgardie gold fields in Western Australia, and particularly of one mine in the district discovered by two young adventurers named Bailey and Ford. The former, while prospecting, found a 45-ounce nugget sticking out from a reef in a big mountain of quartz. As quickly as possible a claim was staked out, but, in spite of all precautions, much valuable surface ore was stolen before a proper guard could be established.

The monthly output from the mine now amounts to 2000 ounces. From 30 tons of ore picked from a bulk of 1400 tons, 18,000 ounces of gold was obtained, and the remainder of the stone is expected to yield from five to six ounces to the ton. Out of 650 tons raised from a depth of 15 feet, 12 tons were picked, giving 8500 ounces of smelted gold. From another part of the mine four tons selected out of 100 tons of ore yielded 1600 ounces of gold. Some of the other returns of picked stone were: Five tons from 250 tons for 2000 ounces, two tons from 70 tons for 900 ounces, four tons for 1000 ounces, and 35 hundredweight for 800 ounces. Some of the surface "is so rich in gold that ounces can sometimes be picked out in a few minutes." Down to the 50-foot level only it is estimated that gold to the amount of 40,000 ounces is now in sight. It is as yet too soon to speak about the prospects of other claims which have been pegged out in and around Coolgardie. Very few of them have got beyond the rudimentary stage of prospecting claims, although reports have been received of some valuable finds, among which may be cited a reef carrying ten ounces to the ton, and the discovery of nuggets of fifty-two-ounce weight on a field forty-five miles distant. The population of the place amounted to about 1500 some weeks ago, but since then has diminished in consequence of the terrible hardships which must be encountered there owing to the climate.

A RAIN-MAKER IN INDIA has an apparatus, consisting of a rocket capable of rising to the height of a mile, containing a reservoir of ether. In its descent it opens a parachute, which causes it to come down slowly. The ether is thrown out in fine spray, and its absorption of heat is said to lower the temperature about it sufficiently to condense the vapor and produce a limited shower.—Atlanta Constitution.

Scientific Progress.

Tide Wells in the West.

Scientists favor the opinion that Nebraska, Kansas and parts of Indian Territory are situated over an immense underground lake or sea. It is a well-known fact that in several places in Kansas whole sections of land have suddenly disappeared, leaving only fathomless lakelets to mark the spot where they were once situated. Proof that there is something peculiar with the foundation of the section of country mentioned may be found in the celebrated "tide wells" of Polk, Butler and Colfax counties in Nebraska. Polk county is best provided with these curious wells, having between a dozen and twenty, which roar and ebb and flow with an unseen tide. The roaring of these remarkable curiosities (they cannot be called natural wonders, because they are the work of man, at least so far as excavation is concerned) is caused by the inhalation and exhalation of immense quantities of air. There are hours, regular and uniform, in which the air will rush out with a loud, hissing sound, and again an equal space of time in which it seems that all the air of the Platte valley will be sucked into the cavernous depths of these wonderful wells. The period of this ebb and flow does not seem to depend upon either the seasons or the state of the weather, but is thought to have some mysterious connection with the high and low tide periods of the Atlantic and Pacific oceans. A meteorologist of national reputation, who sought to fathom the mystery of the "Platte river tide wells," and who issued a little pamphlet with the title "Roaring Wells of Nebraska," gave it as his opinion that the roaring phenomenon was in some way connected with the prevailing direction of the wind, being strongest in time of west or southwest breezes. The farmers in the three counties mentioned as being best provided with these tide-regulating, air-expelling wells believe that the water supply is connected with a body large enough to have a regular ebb and flow of tide. All the wells in the counties of Polk and Butler which are tide regulated are of about the same depth, those of Colfax being deeper, but all extending to a porous stratum having the same general characteristics.

The Earth's Motion Made Visible.

Place on the floor of a room free from tremors and air currents a good sized bowl nearly filled with water, and sprinkle over the water an even coat of lycopodium powder, and across this make a narrow black line of pulverized charcoal. Place the bowl so that the black line shall coincide with a crack in the floor; or, if the room be carpeted, lay a stick upon the the floor exactly parallel with the mark. After a few hours it will be found that the line is no longer parallel with the stationary object, but has moved from east to west, proving that during this interval the earth has moved from west to cast. The reason appears to be that the solid floor has, with the earth and bowl, moved from west to east, and so has the water also, but at a slower rate, as there is a slight inertia, of which the yielding liquid does not instantly partake, to be overcome. It will be seen that the line or charcoal mark always moved from east to west.

Some Coming Electrical Wonders.

In the new foreground, foretells Professor E. J. Houston, one can see a practical method for the production of electricity direct from the burning of coal. Assuming the cause of chemical affinity to lie in the unlike electric charges of the combining atoms, "I see the practical realization of electric synthesis, whereby wholesome food products will be directly formed under the potency of electric affinities. I see, too, a marked advance in electro-therapeutics, whereby human life may be prolonged and its sufferings alleviated. Diagnosis and prognosis will be profoundly aided by exact electrical measurements of the various organs of human body as regards their electric-motive force and resistance. The electric-therapeutist of the future will employ electric charges and currents for restoring the normal charges and currents of the body, as well as for the stimulation of nervous or muscular tissues." "Back of these achievements," adds Mr. Houston," "I discern a practical apparatus for seeing through a wire—that is a device for looking into a receiver at one end of a metallic wire and seeing therein a faithful reproduction of whatever optical images are impressed on a transmitter at the other end, even though thousands of miles interveue. I see the possible use of the step-down transformer for the preparation of a road-bed or road surface by the vitrification of clay, or other suitable soil, by the intense heating power of enormous currents of electricity." He can see a good deal.

All Metals Have the Same Degree of Conductivity at Zero.

Prof. C. Dewar is makiug steady progress in his wonderful discoveries as to the effects of low temperature, says the New York *Sun's* Loudon correspoudent. He gave the results of his latest experiments in a lecture before the Royal Institution recently. The table was covered with many flagons of liquefied air enveloped in carbonic acid snow. He said he had proved that at absolute zero all metals have the same degree of conductivity to electricity, however much they may differ at higher temperatures. Prof. Gladstone's theory of refractive indices of gases had been perfectly confirmed. He fouud that a low temperature greatly increased the strength of metals. Iron at 180 deg. C. had twice the cohesive power it possesses at an ordinary temperature.

A fully saturated magnet was found to have its power greatly increased by a reduction to 180 deg. C. Intense cold has a strange effect on color. The professor sponged a scarlet card painted with iodine with liquefied air, and the brilliant scarlet changed to orange, but recovered its original hue immediately after it became warm again.

Many brilliant experiments were made by sending electric discharges through exhausted glass globes. All the well known phenomena of phosphorescence ceased as soon as intense cold was applied. The electricity tried to pass by any route rather than through the globe. What did this mean? asked the professor. Obviously that something was now frozen out which had before enabled electricity to pass across the vacuous space.

Gilbert Theory Concerning the Moon's Face.

The Gilbert theory, recently propounded by the well known scientist of that nome, concerning the moon's face, assumes that material constituting the moon once surrounded the earth in the form of a Saturnian ring; that the small bodies of this ring coalesced, first gathering around a large number of nuclei finally all uniting in a single sphere—the moon—the lunar craters being the scars resulting from the collision of the moonlets. It is argued that this hypothesis reconciles the impact theory with the circular outline of the lunar craters and explains the abundance of colliding bodies of large magnitude, such a system also accounting for the formation of lunar wreaths, central hills, arched inner plains, level inner plains, and the association of inner plains with central hills, explaining, too, the peculiarities known as furrows, sculpture, rills, and rill pits. Further, during the growth of the moon, it is assumed that many of the mooulets must have collided with the earth and formed impact craters, which have been obliterated by erosion and sedimentation; and it is suggested as possible that these collisions imitated not only the differentiation of continental and oceanic plateaus, but the series of geographic transformations of which geologic structure is the record.

Recalling a Mailed Letter.

To recall a letter once mailed is almost as difficult a task as to take back an assertion once uttered. The sender must appear at the postoffice aud is handed a blank to fill out. In this he must state when and where he mailed the letter, how it was addressed, must describe the envelope, state the amount of postage prepaid, and testify "that the above-mentioned letter was written by me or by my authority and I desire to recall it for the following reason"—and then state the reason, which is usually "mailed by mistake."

He must then sign his name, so that the handwriting may be compared with that on the letter, and sign a receipt. If the address cannot be shown to be in his haudwriting, or is printed or type-written, he must describe some peculiarities of the envelope sufficient to identify it. If he is unable to do this the letter is refused, unless the postmaster kuows the applicant and is satisfied coucerning his good intentions. If he is satisfied he asks for a statement concerning the conteuts, and the applicant is then obliged to open the letter and read portions of it in the postmaster's presence, to prove that it is the one he described.

But if the letter has been sent away the process of recalling is still more difficult. A similar blank has to be filled out, a minute descriptiou telegraphed at the sender's expense to the postmaster at the office of its destination. If discovered in time the letter is then intercepted and sent to the department at Washington with a statement of the case. Why should anyone want to recall a letter so much as to take this trouble? Well, there was one case at the local office recently where a valuable deed was mailed and the sender received information that satisfied him that the sale should not be made. In another case an important contract was sent, and information received immediately after made it imperative that it should be revoked.

THERE is talk of lighting with electricity about twenty-five miles of the dredged channel of Mobile bay. At present the path is too dark and tortuous for night navigation. It has been proposed to use copper for the armor as well as the core of the cable supplying the current, as induction is so great with steel sheathing as to interfere with the transmission of an alternating current.

AN ELECTRIC RAILWAY 300 miles long, to cost $2,000,000, and connecting Boise City and Lewiston, Idaho, *via* White Bird, Little Salmon and the Weiser valley, is in contemplation.

INVENTOR WISHES TO MAKE THE ACquaintance of a Practical Miner, one who has had experience on the upper Fraser, British Columbia.

Address, **J. M. THORP,**

COLLEGE PARK, - - CALIFORNIA.

Professional Cards.

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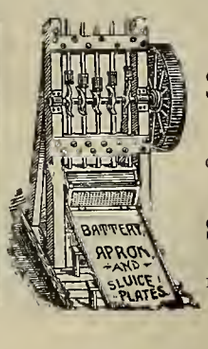

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Boiler Testing.

"How do you know when a plate is crystallized in a boiler?" is a question frequently asked engineers. A plate that is crystallized has a bell-like ring, while a good plate has a deader sound. An old engineer used to say that when the plate sounded as though it was good he knew it was bad, and when it sounded dull, as though something was the matter, he knew it was all right. That is one way of putting it. The inexperienced engineer would say the crystallized plate was the good plate every time, if he judged by the sound alone.

"Every boiler-maker isn't an expert at finding cracks in a boiler shell," said an inspector the other day. "I found a crack in a boiler a little while ago directly over the fire about half way up to the brickwork. We ordered a patch put on, but word came back that there could be no crack in the boiler, as the boiler-maker had hunted over every inch and could not find it. I wrote them where the crack was, but still the boiler-maker could not find it, and I had to go out and draw a chalk mark around the crack before the boiler-maker discovered it."

Small cracks in a boiler are not always easy to find; they cannot always be seen and must be detected by the sound or feeling. The latter method is the surer. The inspector taps with his hammer along the boiler shell, with his finger on the plate a few inches in advance of the hammer, and his sensitive finger will feel the vibration of the plate if it is injured. But if there is a crack in the plate between his finger and the hammer, no vibration can be felt, the crack preventing it. In this manner the crack can be readily located.

The Great Cost of Cable-Laying In New York Streets.

The chief reason why New York, aside from the difficulties of obtaining the necessary permits from the city authorities, was so far behind other cities in replacing horse-car lines by cable roads was that here the cost of laying the cable was much more than in smaller cities. The expense of cutting a path through the network of pipes of every description in the New York streets frightened capital away. At Broadway and Fourteenth street there were no less than 32 different pipes, belonging to more than a dozen different companies — gas, water, sewer, steam, pneumatic, electric, etc. All these companies had rights which the cable company was under bonds to respect. The work of getting the pipes out of the way had to be done without interfering with the service of each of these corporations. Sometimes days were wasted in trying to find the owners of pipes that had been abandoned, perhaps, for years. Gas companies and steam companies had gone out of business, but had left their pipes to make the confusion under the pavements worse confounded. The enormous cost of this work explains the high price asked by some of the contractors for certain parts of the lines in New York City. Some blocks along the lower part of the Bowery are said to have cost the contractors at the rate of $300,000 a mile.

Heating Iron in Cold Water.

It would now seem as though the common but time-honored blacksmith's forge and all other kinds of fiery furnaces will become extinct and live only in the memory of a rapidly-receding past. The forge and furnace of the future will consist of a lead-lined glass or porcelain vase or cupola filled with cold acidified water, to which is connected a strong positive conductor. A pair of tongs with insulated handles, attached to a flexible negative conductor, are also provided, making this new forge and outfit complete. The smith seizes the piece of iron he wishes to manipulate with the insulated tongs, and plunges it into the sour water, which begins to boil and bubble the instant it comes in contact with the iron which, in a remarkably short space of time, turns to a red and then to a white heat, ready for the work of the smith. So rapidly is the heating done that the water and the portion of the iron not immersed are but slightly warmed. The principle involved in this process is the same as in incandescent electric light. Resistance produces the light and heat. It is said that enormous heat can be produced by this method, much greater than is necessary to extract the iron from the most refractory ores. Like all, or nearly all, of the late practical applications of electricity, says *Machinery*, this discovery will no doubt lead to marvelous results in the perfect and rapid handling of heavy iron and steel plates and bars that have to be hammered and welded; and more valuable still for tempering purposes, as the required heat for the immersed portion can be quickly obtained while the remaining portion is kept comparatively cool, which cannot be done by present methods. By electricity we live and move, and by electricity some of us die.

A SPANISH INVENTOR claims to have produced an iron automaton whose inner organs are machinery and whose diet is cartridges. The rifle which the monster carries can be turned in any direction, and delivers 50,000 shots in 15 minutes. Electricity provides the motive power by which the machinery is set in motion.

A FRENCH PHYSICIAN has devised a vibrating helmet for the cure of nervous headache. It is constructed of strips of steel, put in vibration by a small electro-motor which makes 600 turns a minute. The sensation, which is not unpleasant, produces drowsiness; the patient falls asleep under its influence, and awakes free from pain.

THREE THOUSAND THREE HUNDRED AND FORTY-ONE SHIPS, of 7,659,000 tons, passed through the Suez Canal in 1893, yielding sixty-eight millions in dues. According to the report of the company, about to be issued, passengers numbered 186,495, and yielded 1,864,000f., while sundry accessories yielded 384,000f., making a total of seventy-one millions. Three thousand and eighty-two of the ships, 92½ per cent, passed through by night. The average duration of transit was 20 hours 44 minutes, of actual motion 16 hours 53 minutes. There were nine petroleum vessels. As to the nationality of the vessels, the English were 2405, German 272, French 190, Dutch 178, Austro-Hungarian 71, Italian 67, Norwegian 50, Ottoman 34, Spanish 29, Russian 24, Portuguese 10, Egyptian 5, American 3, Belgian 1, Brazilian 1, Japanese 1.

WYOMING has 30,000 square miles of coal deposits. There are 5000 miles of irrigating canals, watering 2,000,000 acres. The canals cost over $10,000,000. The live stock interests exceed $100,000,000 in value. Over $5,000,000 in bullion has been taken from the mines in one county.

GREENLAND'S interior is estimated to be covered by a shield-shaped cap of snow and ice not less than 5000 feet, or one mile, in thickness.

THE Congo has twice the extent of the navigable waters of the Mississippi and its tributaries, and three times its population.

THE sound of a bell which can be heard 45,000 feet through the water can be heard through the air only 456 feet.

THE deepest boring is that of Schadebach, in Prussia, 5736 feet deep—a little over one mile.

THE opportunity of a lifetime may not last five seconds.

Balking the Umbrella Thief.

Another long-felt want is about to be filled. Drawings for the invention were received at the Patent Office only a few days ago, and the man is preparing to build him a new house in the most fashionable part of the city with the prospective funds from his invention. It is nothing less than an automatically returnable umbrella. That is, one that will make its own arrangements for its return to its owner when lost. The nomadic habit of umbrellas, especially when left unchained in the neighborhood of a crowd, has long been a subject of comment, and it has been a serious question whether the trouble was altogether with the morals of the umbrella that would go off and lose itself, or an innate depravity of the umbrella-using public that made findings keepings without much inquiry as to the identity of the loser. The new non-losable umbrella does not differ essentially from the ordinary article, except that it has a little stouter handle. Herein is concealed the working part of the device. It is a compactly arranged phonograph, with a multiplying reverberator, enabling it to be heard for say the length of a street car or a good-sized hallway. In connection with the phonograph is a combination lock which sets the machine in action. The owner of the umbrella on setting it down simply switches the combination, and as soon as it is picked up the phonograph gets in its work. The remarks can be arranged according to the taste in oratory of the man who owns the umbrella, and can range from a politely couched request not to disturb the rain protector to a stentorian cry of "Stop Thief," or "This fellow is stealing another man's umbrella," or any other exclamation of a more forcible nature, the strength of the language being only limited by the local municipal ordinances regarding profanity.

THE SCARCITY OF COAL caused by the general strike of the miners has seriously affected many central electric stations in Illinois, says the *Western Electrician*. Several have been compelled to resort to wood as fuel, while some have been obliged to shut down altogether.

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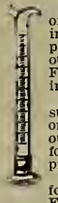
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

Ledger: Work at the Gwin is progressing as rapidly as possible. Lumber is arriving daily, and some of the castings for the hoisting plant are already on the ground. The shaft is down about 50 feet.

The Mayflower gold mine has appealed the cases in which it was defendant and Blamey, Pratt and Evans plaintiffs, respectively, from the Justice's Court of Amador to the Superior Court. The grounds of the appeal are that the defendants' representative, Stephen H. Emmons, was not served by the constable, and that the company is sued under the name of the Mayflower Gold Mining Company when its name is the Mayflower Gold Mine.

The Mason Mining and Milling Company near Clinton has made a successful strike which they claim means a great deal for the interested parties. Their tunnel is in 400 feet and taps the ledge, which shows free gold, and will assay in the neighborhood of $30 a ton. Prof. Newton of the company, the most of whom are residents of Woodbridge, was on the grounds a few days ago and gave orders to put the ore on the dump until a quantity is on hand sufficient to make a milling test. J. L. Cox and E. G. Rutledge have been in charge of the work.

Butte.

THE BULLION MILL.—*New Era:* The Bullion mill has been running now about ten days upon ore from the Keystone ledge with good results. The Bullion Company owns the Keystone as well as the Bullion ledge, and will work Keystone ore, at least for the present. Development work will be continued on the Bullion.

The company has an engine now on the Keystone and is hoisting ore. This ledge is quite wide and the company will find no difficulty in getting ore enough mined to keep the mill in constant operation.

Although the Keystone has to be worked from a shaft, no special pumping arrangements will have to be made, as the mine is so nearly dry that water can be easily handled by the hoisting works.

Calaveras.

THE THORPE MINE.—*Chronicle:* When Capt. Thorpe worked this property, there was a ten-stamp mill on the mine, and the property at that time paid more than expenses, as the records of an old hook still in the possession of Capt. Thorpe shows at various times where dividends were paid to the owners from workings of the mill. However, like the majority of the early worked mines along the mother lode, the time came, about 14 years ago, when the mill wore out and an increase of water resulted in the closing down of operations. The mine soon filled with water, in which condition it remained until some two years ago, when Hayward and Lane took the water out under a bond from the owners, but did not buy it. Again the shaft filled with water. Within the last week the property has been bonded by L. Allgewhr, a successful mining man from Montana, who, with his two sons, have placed a force and lift pump on the shaft, propelled by a donkey engine, and have in five days lowered the water in the shaft 38 feet. It is thought that inside of a month the mine will be cleared of water and ready for the resumption of underground operations. Mr. Allgewhr will leave his sons in charge to clear the mine of water and he will start East in a few days to organize a strong company with capital sufficient to place this old landmark of hullion producers on its feet and make its mark as a second Utica. It is certainly on the same vein.

Modoc.

AT HAYDEN HILL.—*Argus:* Will Dillon was down from the Golden Eagle arrastra last Saturday and told us the quartz mills would start up immediately after the 4th of July. The Golden Eagle Co. is building a new mill on Willow creek, which is now nearly ready to operate.

Owen and White, the principal owners in the Hayseed mine, have reached an extra good prospect.

The Frank Vanderelst mine, which is honded to E. S. Shanklin, is said to be prospecting better than any of the other undeveloped claims.

The Golden Eagle is, and always has been, the most regular mine on the Hill in its gold output. They are now working at a depth of about 300 feet, which is over 100 feet deeper than the shaft of the old Juniper mine, which in its day was the wealthiest mine of the district.

All the mining at Hayden Hill, in years past, was near the surface, and it is only lately that the miners are going deeper into the mountain. Capital has been required to make the proper developments; and since persons of means have become interested, Hayden Hill has taken on an air of activity and prosperity.

Siskiyou.

FROM SAWYER'S BAR.—Gravel mining is a secondary consideration yet; still it adds many thousands of dollars to the annual output of Salmon River, and as the claims are of unknown area, years yet to come will see gravel mining in full operation in our midst.

On the North fork of Salmon, Manuel Joseph & Co. are sluicing at White's Bar.

Louis Moore, at Trook's Flat, is washing rich gravel, and the Gold Nugget with its giant is moving rich soil, as the washups prove.

The Gold Hill is adding its usual quota to the output, and the Paradise Flat is waiting patiently for the dry season in order to begin drifting. The Whistle Bear is sinking, and before many days will be on bedrock, where the precious metal lies. Hickey Brothers are cleaning up after a very successful run and the Buckhorn boys are cutting a race to turn the river so as to be able to commence operations at an early date in the ancient river bed. The Red Hill has turned their mammoth water supply through their pipes and are doing well.

Olsen is smiling and happy at his good luck, and who would not he if he was making a thousand clear every week.

The Gold Ball Mining Company are extracting some remarkably rich ore the last few weeks. A shipment of 500 pounds of the ore to Selby's works realized the sum of $5,000.

Tuolumne.

THE MAMMOTH *Independent:*—On the Mammoth mine, near Jacksonville, work was resumed early in February. They have run on the vein 200 feet, the average value of the ore is $12 all through. In one place the vein was 30 feet wide, the shoot extends 300 feet further, as the clippings show free gold in the rock. Bowlders rolled down the hill from above show gold sticking out of them. Geo C. Webster the owner, has bonded the property to Messrs. McDonald, Whitney & Co.

The old Gashwiler is owned by Alvinza Hayward and the Hobart estate. The owners are sinking a new shaft, which is now down over 50 feet, and on the vein.

The Rawhide mine continues in the same rich ore. The last clean-up produced a very fine bar of gold, but the richest ore is not being stoped, as the owners are getting their mine in good working and systematic condition by putting up raises, etc. It is safe to state the last crushing yielded over $100 per ton. A new shaft is being sunk south of No. 3, or north shaft. Exceedingly rich ore was taken therefrom the past week. The water is being successfully controlled. The only need of this wonderfully rich mine is adequate power. When the new steel pipes are laid to take the water from the top of Table Mountain, all machinery, mill, even to 100 stamps, could all be successfully run by this power. The output then would be something enormous monthly, eclipsing the record of any gold mine in the world.

To the north of the Rawhide, is the Rappahannock, which is being prospected under the management of Richard Chute, one of the owners. The new shaft, almost in the center of the location, is sunk over 60 feet, which at present shows a large body of ore, heavily impregnated with steel gray arsenical pyrites. This lode is undoubtedly the east vein. Gold is seen in pan prospects; also some fine colors are already visible in the rock. The formation is a rich black metallic slate. The management is at present cross-cutting the ore body to determine size and value. Machinery will soon be placed on the mine, which will consist of a 75-horse power engine and boiler, with hoist, etc., just as soon as the necessary buildings are ready to receive the same. This property will be thoroughly equipped for permanent work. Besides, Mr. Chute will also place on the ground a 50-horse power engine and boiler, and a 12-horse power engine and boiler, combined; the latter, will he used for light work, if needed. Three Cornish lifts are also to arrive for pumping. The old shaft, at the south end of the mine, is known to contain rich shoots. It will be unwatered, enlarged and re-timbered, and placed in thorough working order to work that portion of the mine.

NEVADA.

Washoe District.

IN THE CON. CAL. & VA.—Superintendent Lyman's official report says the average assays of car samples of the ore extracted from all parts of the Consolidated California & Virginia mine where new developments are being made was $66.78 per ton. In the mine during the week have been stoping out on the west side of the upraise between south drifts 2 and 3 in the ore body recently found, the ore in this direction looking well. The upraise from the sill floor of south drift 4, on the 1700 level, has been continued upward 10 feet with the size of two sets of timbers, and connected at the south end with south drift 3. In the upper part of this upraise, near the point of connection, the ore is somewhat better than below, assaying about $40 per ton. Have shipped during the week to the Morgan mill 548 tons 910 pounds of ore, the average assay value of which per railroad car samples was $10.77. The average assay value, per battery samples, of all the ore worked at the mill during the week (470 tons) was $53.38 per ton. Bullion now on hand in our assay office—assay value about $37,000. From the upraise of the 1000 level, 585 feet south from the shaft station, at a point 37 feet above the sill floor, an east crosscut has been advanced 38 feet in porphyry and clay formathon of low assay value.

The west crosscut started 119 feet in from the mouth of the drift running south from the crosscut run west from the main north drift on 1465 level of Ophir has been extended 18 feet; total length 45 feet; face in harder porphyry, carrying clay separations. Have continued jointly with the Mexican Company the work of making repairs in the main shaft at the 1100 level. Central tunnel—The west crosscut started from the drift run north from the old Mexican shaft on the tunnel level at a point 26 feet north from the shaft has been extended 61 feet; total length 203 feet; face in a porphyry formation, with some quartz of low assay value. The north drift from the end of the west crosscut 56 feet above the tunnel level has been extended 51 feet; total length 90 feet, continuing along in quartz and old fillings assaying from $5 to $10 per ton.

The Union Con. and Sierra Nevada joint north drift on 900 level, which was run from the joint west drift at a point 1520 feet west of shaft, has been extended during the week 22 feet; total length 475 feet; face in hard porphyry. The joint south of lateral drift from the joint west drift, at a point 1520 feet west of the shaft, has been extended 10 feet; total length 162 feet; face in clay and porphyry.

The west crosscut started from the top of the upraise of Mexican, which was carried up 45 feet above the sill floor of 1465 level, at a point 40 feet west from the main north drift and 100 feet north from the south line of the mine, has been extended during the week 24 feet; total length 154 feet; face in porphyry, clay and quartz.

The north drift started from the north boundary on the 200 level of Best & Belcher, 1115 feet from northwest drift, has advanced 30 feet through soft porphyry; total length 86 feet. Northwest drift started in west crosscut 2, 414 feet from main north drift, on 800 level, has been advanced 23 feet; total length 108 feet; face in quartz and porphyry. The south drift started in west crosscut 5, 1115 feet from the northwest drift, on the 200 level of Gould & Curry, has been extended 14 feet; total length 100 feet; face in quartz giving low assays. From the end of this drift we ran an east crosscut, No. 2, and advanced it 23 feet, passing through quartz giving low assays. Work was discontinued in this crosscut, with its face in porphyry.

A west crosscut from the end of southwest drift, 100 level of Hale & Norcross, has been advanced 11 feet; total length 41 feet; face in clay and porphyry. We continue easing timbers in the main southwest drift on this level. East crosscut from the south drift, 1100 level, was advanced 9 feet; total length 30 feet; face in hard porphyry.

IDAHO.

THINLY SCATTERED. — Pocatello *Tribune:* Frank Gibbons is back from a two months' prospecting trip. He was all along the Snake and its tributaries clear into Owyhee county. The bars along the Snake river, he says, are staked out from below the mouth of the Bruneau clear up to the foothills. There is gold everywhere, he says, but not enough to pay with a rocker. Mr. Gibbons was over into the opal fields in Owyhee and took up an opal claim, bringing back one small opal as a trophy. Everything is dead there—not a single claim being worked.

NORTH CAROLINA.

COLUMBIA MINING COMPANY. — This company, which has its offices in Washington, and of which Dr. A. C. Patterson is secretary and treasurer, during the past four months has been operating two improved Crawford mills at their gold mine near Carthage. An immense ore body has been developed and while the ore is low grade, yet this mine promises to become one of the largest in the South. The cost of mining is said to be little more than that of quarrying. Over 1000 tons have already been treated by the two mills in question, and the average amount cleaned up has been about 84 per cent of the assay, exclusive of a quantity of rich concentrates. The ore is comparatively free milling, though, owing to the presence of sulphurets, not more than 50 per cent of the value has been saved by stamps. The capacity of the Crawford mill on this ore is over 10 tons per 24 hours, and so gratifying have been the results obtained that three more Crawford mills have been ordered by the company, and before the end of April a complete plant of five mills, with a capacity of about 52 tons daily, will be in operation at this mine. Mr. Alfred A. Watson of Carter's Mills, Moore county, is manager of the mine. While miners have admitted, as a rule, that the principle of the Crawford mill is correct, yet some have contended that the cost of the wear and tear must always be excessive. It is claimed that proof to the contrary is afforded at this mine, where the cost of wear and tear on the treatment of 1000 tons is shown to be only 20 cents per ton. Several other mines in the neighborhood, at present at a standstill, are considering the advisability of adopting the Crawford mill in consequence of the results at the Columbia.

OREGON.

Tidings: Mr. Rader, who has taken $8,000 out of pockets in a rich vein on the stage road between Hornbrook and Yreka, took out another $100 in a day or two with a mortar. Dr. Taylor has an extension on his ledge. Crooker Bros. are about completing their wing dam at Anderson's Klamath river ferry. Horn, Smith & Co., one mile further down, are rapidly completing their wing dam. W. R. Price has bought the Oregon bar and is rafting lumber for a wing dam. The American Bar Company, who run their wheel over a suspended bridge, are getting ready. C. B. Gillson & Co. are busy piping their blue gravel.

BAKER COUNTY.—*Democrat:* Before the summer has far advanced the Payette river in the vicinity of Marsh will be the scene of great activity. A number of eastern capitalists have become interested in placer mines in that section and they propose to commence operations soon on an extensive scale.

The Denver company will commence work shortly on their high bars. W. W. Booth and other prominent Denver mining men are interested in this company and they will put in some elaborate machinery to raise the water to the bars.

John McKinley, of Duluth, who, with other gentlemen from that place, have secured control of a large tract of placer ground near Marsh, proposes to begin operations at once. A large dredge machine has been ordered and will arrive here shortly. The machine is said to have a capacity of 2000 cubic yards a day.

A clean-up was made a few days ago in the William & Corker mine at Neal, which was recently purchased by Mr. Balhach. The amount of the clean-up is not known, but the owner is more than satisfied with the result. Some remarkably rich ore is now being taken out of the mine.

It is reported that a rich strike has been made in the Denver mine at Neal, owned by Dave McNutt and J. Hudson. They have opened up a four-foot vein of good ore, some of which is said to be phenomenally rich. The Denver is but a short distance from the Homestake.

The mines of Baker county are making an excellent showing. Both placer and quartz properties are yielding handsomely and if indications do not fail the output rolled up this season will excel that of any two years combined in the past quarter of a century.

SOUTH DAKOTA.

TROUBLE IN A TIN MINE.—Albert R. Latoux has been appointed temporary receiver of the Harney Peak Tin Mining, Milling and Manufacturing Company.

The complaint accompanying the application for a receiver charges fraud against the trustees of the defendant company.

The Harney Peak Tin Mining, Milling and Manufacturing Company was incorporated April 16th, 1884, to do business in the Black Hills region of Dakota. An immediate issue of $5,000,000 was made at once to buy, as it is claimed, property worth only $17,000. On January 31st a second issue of $3,000,000 was made to Oliver F. Berry as trustee, and the following year a third issue of a like amount to Henry Clausen. The English complainants afterward took some of the stock, which they now say was issued to the trustees as a blind, and that the hooks were so juggled as to make it difficult to discover the fraudulent conspiracy and gains which they allege were divided among a syndicate of stockholders. An agreement was entered into by which the Englishmen obtained 90,000 shares of stock at $100, par value, in addition to $1,535,000.

A small sum of money was paid, but subsequent agreements were made by which the Englishmen were to issue £1,000,000 in bonds of an English company, giving security for the rest, which they failed to do, but $1,000,000 were put on the Black Hills property, which were issued to the English company in part pay and partly as security.

Another £1,000,000 mortgage was afterward placed and about 400 mining claims were purchased, but an attempt was made to work only 20 of them, and the only thing mined, according to an affidavit of George W. Hamilton, was 1000 tons of ore, which has never been treated. The Englishmen who had invested between £3,000,000 and £5,000,000, becoming suspicious, sent over agents to investigate, and, it is alleged, found that the American owners had put up only $280,000 in cash for all the property. Not more than $600,000, it is said, had been expended in working the mines and building the mills, and the English want to know where the millions went to.

UTAH.

A BIG ENTERPRISE.—S. L. *Tribune:* On July 12th it will be just six years since the big tunnel for the Ontario mine was started. From the outer end it is just 15,560 feet to the bottom of No. 3 shaft. Of this, 14,725 feet have been cut, leaving 835 feet yet to penetrate.

Progress the first two or three years was at the rate of ten or twelve feet per day while driving, but there were frequent stoppages on account of striking streams which flooded the tunnel so badly as to stop work for a time. Then there was the destruction of the power plant and some other things which stopped progress, but the worst feature has been ground which was extremely difficult to go through. Such places have been designated as "soft," because the water and broken stone, along with the sand, would run into the tunnel faster than possible for the men to take it away. Such places required a difficult and slow kind of piling, with great care in handling and putting in the timbering.

If the ground was solid it would take only a few months more to complete the tunnel, and then all water in the mine down to the 1500-foot level could be run out.

At present the tunnel is discharging between 12,000 and 13,000 gallons of water per minute. It has relieved the mine already, or at least the amount required to be pumped is much less than it was a few months ago. The big Cornish pump used to be run at a speed of eight strokes per minute. This has been reduced to five, making a big difference in the amount of fuel required to operate the pump. It requires about fifty tons of coal per day to furnish the steam for the Cornish pump and the several large pumps which raise water from the 1500-foot level up to the 1000-foot, where the Cornish pumps take it and raise it to the 600-foot level, where it runs out through the old drain tunnel. To operate these pumps requires about forty men, who are divided into shifts, and there is never a time but men are on duty.

With coal costing $6 per ton, and good wages to capable pump men, the reader can form some idea of the cost of getting rid of this water, an expense which will be saved to the Ontario and Daly mines on the completion of the new tunnel. These two mines are drained through the same medium and share in the cost thereof.

There is one feature of this great work which people do not generally understand. The question is often asked: "Is the Ontario and Daly going to shut down because of the price of silver?" Men are sometimes in the position of holding something they cannot let go of. These companies are just in that condition. To stop mining the half hundred or more miles of drifts, levels and stopes in the two mines would soon fill up with water, and that would cause almost if not quite total destruction. As it is now, it requires a large number of men constantly employed in easing timbers and putting in new ones. This latter work will have to go on as long as the property is held for production, even if it is not mined. When the drain tunnel is completed it will allow the big pump to stop running until the work has gone below the tunnel, and the water down to the 1500-foot level will simply run out, and the saving will soon pay for all the tunnel will have cost. While the pay roll and fuel bills will be materially lessened, there will most probably be but little if any change in the operations of the two companies, which will go on producing silver as in the past. The companies have too large interests and too much money invested to permit idleness of these two, among, if not the greatest, silver mines in the world.

THE COMSTOCK MINE.—*Tribune:* A short

time ago work was stopped on the Comstock mine at Park City. Manager M. Duseldorf is in the city and to a *Tribune* reporter he said that right after July 4th be would put 15 or 20 men at work to sink on the four-foot vein which was cut hy the tunnel at a point in 200 feet. This is good ore; hut as it is only about 50 feet under grouud at that point, it is too near the surface for good stoping, so he intends going down 100 feet and begin taking cut ore there. Besides the four feet of ore on the footwall, the vein has ten feet of red quartz, which it is expected will develop into good ore helow. Last week 7000 shares of Comstock stock wns sold in New York City at $1 per share, and there is a demand for more, which will place the company in shape to go down and then take out ore, from the sales of which they will get returns to put in machinery. Fortunately, there is no water aud no ueed of pump machinery at present. Numerous small seams of ore have heen cut in driving the tunnel.

Coast Industrial Notes.

The Fulton Engineering and Shipbuilding Works gave their new Sausalito ferryhoat a satisfactory trial trip on the 28th ult.

—The San Joaquin Lumher Company of Fresno has sold its improvements and stock of lumher to the Madera Flume and Trading Company.

—Several hundred employes of the Kings River Lumber Company, at the mills near Sequoia, Fresno county, demanded a reduction to only ten hours' work a day instead of eleven hours. The office in Fresno refused to comply with the demand, and sent word to close the mills.

—The San Francisco Tool Company has brought an attachment suit against the Piedmont Cable Company for $32,933, due on a note made May 1, 1893, attaching all of the personal property of the company left unsold after the recent attachment sale of the Oregon Improvement Company.

—By August 25th there will he a large smelter at Spokane. The deal has been concluded. The steel rails for the track are on the way from the East. While the new smelter company will not bear the name of the great Standard Oil Company, it is understood that it will he controlled by that great corporation.

—In building up and strengthening the bulkhead at the Cascade locks 3000 barrels of cement were used, which is a dead loss. It costs $2.50 per harrel, making for this one item of the expense $7500. When the labor and other expenses are figured up the cost of protecting the locks will reach in the neighborhood of $30,000.

—One hundred and thirty-quarrymen employed hy the San Francisco Street Improvement Company, contractors for the Government work being done on the jetties at Humholt har, went out on strike last Monday, demanding au advauce of 50 cents. The wages of the quarrymen were $1.25, $1.50, $1.75 and piledrivers $2.50.

—The South Yuha Water Company has hought the water rights of the old Fall Creek Compauy, and will use the ditches formerly used to convey water from the Blue, Rucker, Feeley, Culhertson and other small lakes to the head of the Blue Tent ditch, in the South Yuha canyon. The ditch will be used to lead water from all these lakes to the new Lake Spaulding, above Bear valley.

—At a recent meetiug of the Harbor Commissioners hids were received for supplying coal as follows: Dunsmuir & Sons, Comox coal, $6.38 per ton; Wellington, $7.24; J. Macdonough, Wallsend, $7; Black Diamond, White Ash and house coal, $5.80; Charles R. Allen, Nanaimo, $6.39; J. C. Wilson, Wallsend, West Hartley and Brymho, $6.75; Oregon Improvement Company, Franklin coal, $5.75.

—B. F. Peregrim, of Florence, Or., for nearly nine months has heen building a steam harge on novel lines, and expects to have it here by August 1st. It is a large doublehender, and will he propelled hy a wheel located in the center of the harge. The huilder's idea is to have a hoat that can compete in all kinds of husiness in deep water or on the small streams. His hoat will draw little water, and the owner believes that he will he ahle to enter the small streams opening into San Francisco hay, and dock how or stern first, as the case may demand, and his machinery and wheel are constructed on the plan of a ferry hoat, so that the hoat can run either way. The barge is to he fitted up with a large mast and swinging derrick, with which he will be enabled to run up aloug the levees on the river banks and easily load his freight. The lumher capacity of the barge is about 200,000 feet. It is intended to hring the harge down the coast under full sail.

In the U. S. sub-treasury, in this city, there was eash on hand on the 1st inst. as follows: United States notes, $22,269; treasury notes, 1890, $23,080; national bank notes, $29,460; gold certifieates, $5450; silver eertificates, $88,-215; gold coin, $10,949,476; standard silver dollars, $24,781,882; subsidiary silver coin, $930,277.15; minor eoin, $26,132.95; fraetional currency, $11; total, $36,856,253.10.

The Alaska Gold Placer mining Company has ineorporated, with a capital of $1,000,000, of whieh $625,000 has been subscribed.

Notices of Recent Patents.

Among the pateuts recently ohtained through Dewey & Co.'s Scientific Press U. S. and Foreign Patent Agency, the following are worthy of special mention:

Ore Grinder and Amalgamator.—Charles N. Moore, Newhall, Cal. No. 521,663. This invention relates to an apparatus for grinding and amalgamating ores of rock containing precious metals. It consists of a pan having an inclined hottom and fixed central post with a standard about which the center of the pan is fitted to revolve, horizontal shafts extending outwardly from heneath the hottom of the pan, anti-frictional rollers upon said shafts, and flanges upon the bottom of the pan adapted to travel upon said rollers, a toothed gear surrounding the hottom of the pan, pinions upon the horizontal shafts engaging said gear, and mechanism wherehy the shafts are driven so as to transmit motion to the pan, together with grinding shoes or rollers movahle over the hottom of the pan, and gearing conuecting the rollers with the shafts so that they are driven in opposite direction from the movement of the central portion of the pan. Tbe ore is fed in through the eeuter and delivered hetweeu the rollers and the dies aud is thereby crushed. Screens around the sides of the pan allow the dust or pulp to pass out when it becomes sufficiently fiue, and it falls iuto a surrounding amalgamated copper trough.

Folding Crate.—Arthur W. Coats, Ukiah, Cal., assignor of one-half to James Bartlett of Ukiah. No. 521,640. Dated June 19, 1894. This inventiou relates to a crate of that class which is ndapted to be folded up iuto small compass for the purpose of transportation. It consists of a bottom having side strips permanently fixed upon it, sides having their lower edges hinged upon these strips adapted to open upwardly and outwardly about their hinges and to fold inwardly upon the hottom, slotted links with pins attached to the sides and slidahle in the links to retain the sides in a vertical position when opened, end sections pivoted hetween the permaneut supplemeutal pieces, side rollers adapted to turu ahout their hiuge hars either to fold upon the hottom or to stund in a vertical position and complete the sides and ends of the crate, and interlocking devices to hold the parts in position, together with hinged top sections meeting in the center, and means for locking the whole iu place, consisting of a single rod passing tbrough the sides and engaging the meeting ends of the tops, and vertical truss plates or rods to connect the center and ends of the box and prevent the central portion from sagging when there is considerahle weight in it.

Registering Toy Bank.—Arthur W. Coffin, San Francisco. No. 531,641. Dated June 19, 1894. The object of this invention is to provide a hauk or receptacle for the deposit of various coins from time to time, and a means for registering the amount of each deposit and the total amount contained within the hank, and a mechanism which will operate automatically to release the door wheu any desired amount has been accumulated within the hank, so that it may be removed at pleasure of the owner. The receptacle has a slotted opening at the top through which the coins are iutroduced, a slide controlling the entrance to the opeuing aud actuated hy the passage of the coin, and a mechanism actuated hy the slide so that its amount of movement shall he dependent upon the character of the coin deposited, and in connectiou with this a means for indicating the amount of the deposit, which consists of a toothed wheel, ratchet mechanism connecting with the movahle slide so that the ratchet wheel will he advanced a numher of teeth, dependent upon the varying diameters of the coins introduced. The movement of the wheel is communicated to an indicator or pointer moving over a numhered disk upou the outside of the hank so as to show the amount accumulated therein at any time upon inspection.

There is no necessity for piers or wharves at Ivigtuk (often erroneously called Ivigtut, says Prof. F. H. Knauff), where the vessels load cryolite for Philadelphia. The place is on the Arksuk Fiord, and so bold is the coast that the vessels make fast elose to the rocky walls by the bow, while at the stern they can get no soundings. The eryolite mine ean only be worked from April to October, and when it is abandoned for the winter it is filled with water, only the surface of whieh freezes to a depth of about four feet, whereas if it were left empty the gradual leakage would aeeumulate thousands of tons of solid iee during the winter, so that it could not readily be removed. In the spring the mine is simply pumped out and work resumed. The entire output is sold by the Danish government to the Pennsylvania Salt Co., who manufacture what is not used for aluminum into carbonate of soda and alum.

Considerable mining is being done in the bed of the San Antone ereek, near the old Dunbar saw-mill near the Big Trees.

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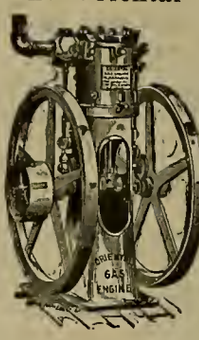
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The volume embraces 130 12mo. pages, with illustrations, well bound in cloth; 1889. Price, $1, postpaid. Sold by DEWEY PUBLISHING CO., Publishers, No. 220 Market Street, San Francisco.

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Electrical Progress.

Electricity in Iron and Steel Works.

At the May meeting of the British Iron and Steel institute, D. Selby-Bigge presented a paper on "Electricity as a Motive Power in Irou and Steel Industries." After showing how electricity has been utilized in iron ore mining the anthor said:

"There may be some at this meeting who may think that the author now proposes to work blast furnaces by electricity. He regrets, however, it is not yet in his power to revolutionize the world by doing this. He would, however, seek the aid of blast furnaces in generating his electricity, and considers that, after a waterfall, a Cleveland furnace is the next best friend to those desirous of generating electric power economically. In many cases there are large amounts of waste gases available from the furnaces. These are generally used for firing the boilers necessary for driving the blowing-engines, etc., but there is frequently a considerable amount of waste gas left over. It is with this waste gas he would propose firing the boilers in connection with the electric generating plant. The power thus generated could be transmitted at a high tension to engineering works sitnated at a considerable distance and, if necessary, transformed again to a lower tension for use in the works. By short distance transmission the author means the distribntion of electrical energy for the purposes of driving engineering works. As already mentioned, there has hitherto been a tendency on the part of engineers to consider electricity as applicable only in those cases where the power has had to be transmitted over a long distance. It is now necessary to consider quite a different case, in which the power has only to be transmitted over distances not exceeding 200 or 400 yards in leugth, bnt in which area a mnltiplicity of uses may be fonnd for the application of electric power to driving various classes of machinery.

"First of all, let the case of iron and steel works be taken, and the classes of machines most freqnently employed in these works be considered. These will be fonnd in a great measure to consist of the following: Punching and shearing machines, straightening machines, cold and hot saws, drilling machines, planing machines, blowers, overhead travellers, locomotive cranes, rolls, winches, scrap breakers, etc.

"In connection with iron and steel works there are frequently found girder shops, fitting shops, etc., in which the machinery is driven through shafting aud belting off one or more engines situated in the shop. In laying down machinery of the above class it has almost invariably been the practice, not only when the machine tools are driven by separate engines, but also when they are driven by belting and shafting, to make allowances in these engines for very large losses, due to condensation or leakage in steam pipes, or to friction caused in the belting and shafting. It is a well-known fact that the power actually expended in performing the work on these various machines is a mere fractional part of that transmitted from the generating source. In those cases where the machine tools have been driven by separate engines, it has been a regular practice to provide engines with cylinders sufficiently large to compensate for any possible losses which may occur throngh leakage, condensation, etc. It seems generally to have been the practice in engineering works to indicate the main driving engines, but during the author's visits to some 30 or 40 of the principle engineering works in this country, he has never been able to obtain indicator diagrams showing the power absorbed by each steam-driven machine tool in the works. Althongh attention has been paid to the economy of the main engines, the qnestion of that in the small engines driving these machine tools, and the conveyance of steam, has often been entirely overlooked, and an enormous waste has been going on in this manner for years past.

"With the advent of the electric motor this condition of things was at once changed. Every electric motor may be said to be a self-indicating machine in itself, in that the power which it absorbs can be immediately detected through the readings on the ammeter and voltmeter provided in connection with the motor.

"The followiug are results of experiments that have been recently carried ont by the anthor, in conjunction with Mr. H. Panton, on the actual power absorbed by various machine tools in doing their work. The fignres are extremely interesting, as showing the very small amount of power absorbed by the different tools when doing their work:"

Table of Electric Motor Tests taken at the Works of Messrs. Dorman, Long & Co., Middlesbrough.

Description of Machine.	Driven by Engine Capable of Indicating.	Replaced by Motor Capable of Indicating.	Voltage at Generator.	Voltage at Motor.	Current taken by Motor.	E. H. P. Absorbed in doing Work.
Group of Machines as under—	H P	H P			Amperes	Per Cent.
Three cold saws.. Two ending machines..... One saw-sharpening machine.....	27	10½	120	115	70	10.7
Troughing straig't-ening machine.....	14	3½	120	118	12	1.9
Double-ended punch, punching four holes one side and one other.....	14	5	120	115	25	3.7
Straightening machine, all sections.....	14	3½	120	115	15	2.3
Straightening machine, biggest sections....	16	3½	120	115	35	5.4
Cold saw, 26 inches diameter.....	9	3½	120	110	15-27	2.2 & 3.9

The saving in coal effected on above machine tools amounted to 30 tons per week, after the adoption of the electric system.

CITY AUTHORITIES may pass ordinances regulating car speeds withont end, bnt it is asking too mnch of a motorman to calculate or even to gness at the speed of his car in addition to his other exacting duties. What is wanted is a simple and reliable speed indicator, which will enable a motorman to tell at a glance how fast he is running. The *World's Progress* believes that its introdnction will be followed by a reduction in the nnmber of trolley accidents, and that the cost would be but a bagatelle compared with the redncion in the amounts now paid for damages.

THE second century of the electric age has begun this year. The discovery of Volta was first published in a scientific journal at Pavia, where he was professor. Volta's theories are not exactly followed by modern scientists, bnt his pile is in all hands, and it was the origin of that extraordinary development in the application of electricity that has transformed international and social relations, and added an altogether new phase to hnman life. Perhaps Volta's discovery has been the most frnitfnl in its effects of any that has ever been made.

"I ONCE HAD TO RUN into Chatham island, in the South Pacific ocean," says an old sea captain, "and was amused to see the way in which the people accepted their fate in regard to the jumping of time. This little island is just on the line of demarcation between times and dates. In order to keep right with the remainder of the world, it is necessary to skip from noon on Sunday to noon on Monday every week in the year, and hence the joke that it is possible to spend a whole day at dinner withont eating an average meal. The island is so near the antarctic region that days and nights are altogether mixed up from the idea of an ordinary individual, but this plan of jnmping the afternoon of one day and the morning of the next, so as to keep in line with the almanac, is something so ridicnlons that none bnt a seafaring man can appreciate it or understand the necessity."

The Patio Process in Mexico.

The usual practice in Mexican haciendas de beneficio is as follows: The ore is first crushed dry in Chilian mills to the size of peas. These mills are provided with a single stone runner eight feet in diameter and two feet thick, and are generally turned by mules, althongh another form, with two small runners and actnated by steam power, is coming into favor. The crnshed ore or granza then goes to the arrastras, of which there are never less than 30 iu a hacienda, each being able to treat abont two cwts. per day. These machines are wonderfully simple, and yet they are extremely efficieut; no iron enters into their composition, for stono, hardwood and rawhide take the place of metal. The mullers and bed are made of blocks of a peculiarly tough kind of porphyry, and the toothed wheels which tnrn the vertical shaft of the mill are made entirely of mesquite wood. Each arrastra requires two mules to drive it, but in some haciendas steam is used instead.

It is donbtful, however, whether steam power here is mnch of an advantage under Mexican conditions, especially considering the large amount of shafting and gearing required for snch a number of small mills. It is in the arrastras that the Mexicans recover what they do of the gold contents of their ores, for in the torta afterwards no gold is found in the silver. Copper amalgam is introdnced into the bed of each mill; a cleanup is made every two or three months, and the result is an alloy of copper, silver, and gold containing about 10 per cent of the most precions metal, but the gold extraction is not more than 30 or 40 per cent of the assay valne. The tailings from the torta are also concentrated by hand, and the washed prodnct may contain 10 onnces or so of gold per ton. These concentrates are generally sold to the smelters.

The pulp from the arrastras is run out into settling tanks, and npon attaining the proper consistency is transferred to the patio, where salt, sulphate of copper, and mercury are added, and the mass trodden at intervals by mules. In this stage the two conditions of success are hot sunny weather, and adequate skill on the part of the azoguero or foreman. With plenty of sunlight and heat the amalgamation is quickly completed, and the torta is ready for washing off in abont a fortnight, but in cold, cloudy weather the process may last six weeks, and the extraction will not be so perfect and the loss of mercury much greater. The usual consumption of mercury is a pound and a half for every pound of silver recovered. The greater portiou of this is washed away as calomel, and the remainder is lost mechanically.

The ores are mixed to contain abont 20 ounces of silver per ton, and hence the average loss of mercury is 2½ pounds. In this respect the patio compares unfavorably with pan amalgamation, in which, npon the same ores, the consumption of mercury never exceeded a pound and a half per ton, and was often less. The patio also requires more salt than the pan—*i. e.*, 5 per cent of the weight of the ore against 2 per cent, and the amount of sulphate of copper required is also larger. The total cost, however, of the two processes in Mexico is nearly the same—about $10 to $11 per ton—but in large establishments the cost will be reduced below this figure. If it were not for the high price of fuel and machinery renewals the pan would be vastly more economical than its older rival; bnt under present conditons the principal advantage of modern milling is the great economy of time in gettiug the bullion from the ore.

Further, the scope of the patio process is somewhat limited; clean sulphide ores containing but small amonnts of rnby silver, polybasite, etc., certainly yield 90 per cent, and, in exceptional cases, 95 per cent in the torta, but the slightest per cent of lead, zinc or antimony at once seriously lowers the extraction, increases the mercury loss, and renders the method inapplicable. Chloride and bromide ores do not give up their silver readily to patio amalgamation, and the percentage is not likely to be over 70.

A good furnitnre polish, which gives a soft, oily finish to furniture and woodwork, is made of one scant ounce of linseed oil, one full ounce of tnrpentine and three-fourths of an ounce of cider vinegar.

Send for Price List.

THE JUDSON

Dynamite and Powder Co.

— MANUFACTURERS OF —

Dynamite and Blasting Powders,

18 California Street, San Francisco.

DIRECTORS—C. S. Benedict, Alvinza Hayward, Jos. Knowland, John S. Doe, Ed. G. Lukens (President).

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CHROME CAST STEEL

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Special attention given to the purchase of Mine and Mill Supplies.

Stamp Cam.

Practical Information.

How Granite Columns Are Turned.

According to the census reports, granite for columns, balusters, round posts and urns is now worked chiefly in lathes, which for the heaviest work are made long enough to handle blocks 25 feet long and 5 feet in diameter. Instead of being turned to the desired size by sharp cutting instruments as in ordinary machines for turning wood and metal, granite is turned and ground away by the wedge-like action of rather thick steel disks, rotated by the pressure of the stone as it slowly turns in the lathe. The disks, which are six or eight feet in diameter, are set at quite an angle to the stone, and move with automatic carriage along the lathe bed. Large lathes have four disks, two on each side, and a column may be reduced some two inches in diameter the whole length of the stone by one lateral movement of the carriage along the bed. The first lathe is for turning granite cut only cylindrical or conical columns, but an improved form is so made that templets or patterns may be inserted to guide the carriages, and columns having any desired swell may be as readily turned. For fine grinding and polishing the granite is transferred to another lathe, where the only machinery used is to produce a simple turning or revolution of the stone against iron blocks carrying the necessary grinding or polishing materials. Blocks are prepared for lathe work by being roughened out with a point, and by having holes chiseled in their squared ends for the reception of the lathe dog and centers. This principle of cutting granite by means of disks revolved by contact with the stone has been applied to the dressing of plane surfaces, the stone worked upon being mounted upon a traveling carriage and made to pass under a series of disks mounted on a stationary upright frame.

The Construction of a Coat and Vest Requires a Deal of Labor.

That a lady's dress is a thing fearfully and wonderfully made is a fact that can be testified to by every man who has ever tried to get something out of the pocket when it was hanging up in the closet. But a man's coat and vest are themselves by no means simple affairs, but are the result of more labor than any person not acquainted with the details of the tailor's trade imagines, remarks a writer in the Indianapolis *Sentinel*.

A coat-maker has taken the pains to count the number of stitches necessary in a coat and vest recently made by him. The coat was a single-breasted, three-button cut-away, and the vest of the present pattern. He found that to complete the coat required exactly 33,356 stitches, and in the vest 11,527. For the benefit of those who may be interested in the figures, these totals represented the following: Bastings for the coat, 2575; for the sleeves, 642; for the pockets, 183; for the collar, 392; total, 3792. Hand stitches on the coat, 8501; on the sleeves, 1646; on the pockets, 396; on the collar, under and upper, 2913; total, 13,456; machine stitches, on the coat, 7578; on the sleeves, 3600; on the pockets, 2720; on the collar, 396; total, 14,294. Button holes (gimp holes), 1814. Bastings on the vest, 1469; hand stitches, 2573, and 460 on the pockets; machine stitches, 3654, beside 3022 on the pockets and 349 for the button holes; total, 11,527. The machine stitches were counted at the rate of 18 to the inch. On a coat and vest, then, there are required nearly 50,000 separate and distinct stitches. The old proverb that "nine stitches make a man" is thus proven to be wofully short of the true figures.

A CURIOSITY that is puzzling all comers was recently found at Wallace, Idaho, by William Hiltz, the section foreman on the Northern Pacific. It has the exact appearance of an apple, two and one-half inches in diameter, and is of a dark red color, inclining to black. Upon being sawed through, the color, consistency and density were found to be almost identical with ivory. It is believed by many to be a petrified apple, but it does not possess any mineral characteristics. It resembles vegetable ivory in consistency. It was found in the gravel at a depth of ten feet, which still further adds to the complexity of the conundrum.

Modern Explosives.

The compositions of some of the modern high explosives are as follows:

Dynamite.—Seventy-five parts of nitro-glycerine and 25 of infusorial earth.

Dualine.—Eighty parts nitro-glycerine and 20 of nitro-cellulose (gun cotton).

Rendrock.—Forty parts nitro-glycerine, 40 of nitrate of potash or soda, 13 of cellulose and 7 of paraffine.

Giant Powder.—Thirty-six parts of nitro-glyceriuc, 48 of nitrate of potash or soda, 8 of sulphur and 8 of resin or charcoal.

Mica Powder.—Fifty-two parts of nitro-glycerine and 48 of pulverized mica.

Tonite.—Fifty-two and one-half parts of gun cotton and 47½ parts of nitrate of baryta.

Blasting Gelatine.—Ninety-two parts of nitro-glycerine and 8 of gun cotton.

Atlas Powder.—Seventy-five parts of nitro-glycerine, 21 of wood fiber, 2 of carbonate of magnesia and 2 of nitrate of soda.

Rackarock.—Seventy-seven and seven-tenths parts of chlorate of potash and 22.3 of nitro-benzol.

It will be noticed that nearly all the explosives are composed principally of nitro-glycerine; and it is probable that in most cases the other ingredients only act as absorbents for this liquid, and really add nothing to the explosive force. The decomposition of nitro-glycerine is practically instantaneous, and the slower-acting nitrates and hydro-carbons must be left far behind when the mass is exploded. The power of all these substances is due to the paradoxical element, nitrogen, which is by itself the most neutral and inactive of all the elements, but, when forced into chemical combination, usually confers an element of weakness upon the entire molecule of which it forms a part.

AN INVENTOR has brought out a rocking chair that is actuated by electricity. The sitter can at the same time receive gentle currents by grasping metal handles or by resting the bare feet on metal pedals.

No. 5.

Fraser & Chalmers,

CHICAGO, ILL., U. S. A.

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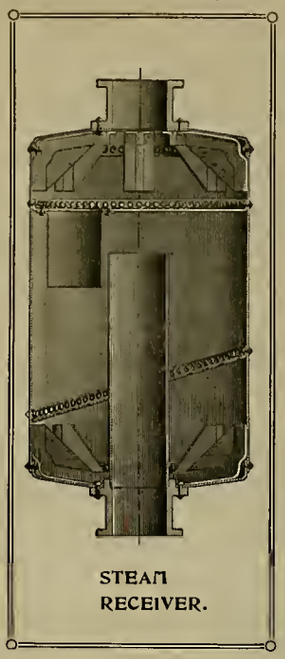


STEAM RECEIVER.

NOT ONLY IS OUR JONES' STOKER HEAD AND SHOULDERS ABOVE THE WHOLE FAMILY OF DEVICES FOR SAVING FUEL AT THE FURNACE, BUT OUR NEW

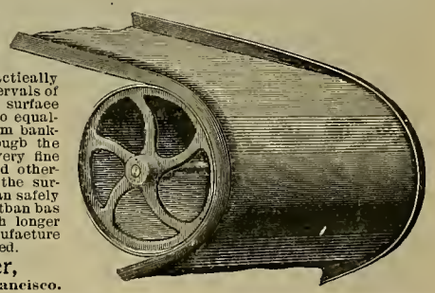
Steam Receiver and Separator

IS AN ENGINEERING DEVICE OF GREAT MERIT, ENSURING FULL PRESSURE OF STEAM AT THE BEGINNING OF ENGINE STROKE, AND A GOOD CUT-OFF.

WRITE FOR NEW PUBLICATIONS ON STEAM ENGINEERING.

The Blasdel Concentrating Belt Co.

WE are now having our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over **any others** will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight rifled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt the surface of which is entirely smooth. We can safely say that it is a better concentrator belt than has ever been manufactured. It will last much longer and will handle more pulp. We also manufacture smooth belts with same flanges when desired.



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419 California Street, - - - - San Francisco.

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Rock Drilling, Air Compressing, Mining and Quarrying

Machinery.

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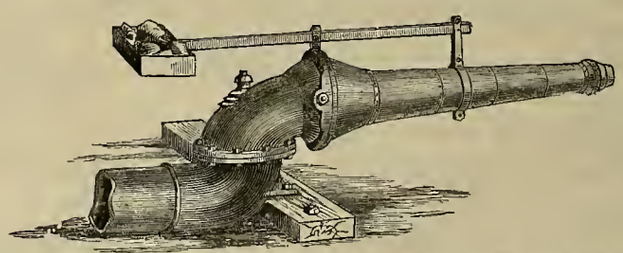
IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 51 Fremont St., San Francisco.

DOUBLE-ACTING

Cornish ★ Plunger.

PUMPS TWICE AS MUCH WATER AS THE OLD PLUNGER. Only about one-third the weight of the old Plunger. Special construction of steel for packing on mules, only one-twelfth the weight of the ordinary Plunger. First outlay one-third less; works with 10 per cent less power.

IMPROVED SINKING PUMP.—Bucket and clack changed under water. Bucket lasts six times as long as the old one, saving expense of putting down another pump where bucket and clack cannot be changed under water. The self-tightening and self-lubricating stuffing box and new bucket also saves expense of dropping extra pumps. WM. NANCE, Grass Valley, Nevada County, California.

Market Reports.

The Markets.

SAN FRANCISCO, July 5, 1894.

The demoralization of midsummer trade is usual; the apathy consequent upon a national holiday is ordinary, but when coupled with these two comes a railroad strike, lock-out, tie-up and boycott, stopping all trade, mail and traffic communication, the combination is a paralyzing one. Nothing has been done during the week that didn't do itself.

New York Prices.

NEW YORK, July 5.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	28⅝	62⅝	....	....	....
Friday	28¾	62¾	9 00	3 20	19 50
Saturday	28⅞	62¾	9 20	3 20	.....
Monday..	28¾	62½	....	....	....
Tuesday	28¾	62⅞	9 20	3 20	19 50
Wednesday	28¾	62½	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½c
New York Telegraphic Transfer	15c
London Bankers', 60 days	$4.86¼
London Merchants	$4.89¾
London Sight Bankers'	$4.89¾
Refined Silver, per ounce	62½
Mexican Dollars, nominal	52@52½

Local incorporations disbursed dividends during June as follows: Banks, $73,500; gas companies, $74,166; Water companies, $73,500; powder companies, $19,500; street railroad companies, $11,000; mining companies, $100,950; miscellaneous companies, $25,200; total, $377,816.

It is thought that during the month of June $3,000,000 in gold was shipped from Bombay to London. That fact indicates the failure of the Indian Government's recent financial experiment. India is not, as a whole, greatly affected. While in common with all the rest of the world gold as a commodity has appreciated in value, the purchasing power of silver has not depreciated. The effort to create a gold standard in India has resulted in nothing but congestion of the yellow metal in the vaults of the Bank of England. In 1873 the value of a "tola" (180 grains troy) was 15¼ rupees. It is now worth 31 rupees in silver. European tactics do not work as well in the case of dependent India as independent America. India prefers silver to gold, as the result shows, whatever "natural law" or any other law may say or do to the contrary.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¼
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2½
Norway, base	—	@	4½
PIG IRON.			Spot.
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	—	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	—	@	— —
Clay Lane White	22 50	@	— —
Langloan	22 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	22 50	@	— —
Cargofleet	—	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10
QUICKSILVER.			
Home trade, per flask	35 50	@	35 75
STEEL.			
English, lb	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lb	23	@	23½
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			6 00
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			7 75
Brymho			7 25
West Hartley			7 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 50	@	— —
Cardiff	7 50	@	— —
Lehigh Lump	17 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	9 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, July 5, 1894.

The railroad complication, the prevalent dullness and the week's holiday have made the week a blank in the mining share business. Everything went down all along the line in June. The up and down of all is illustrated by Con. Cal. & Va. fluctuations, which varied from $2 in March to $9 in May and $2.70 last month. On the Comstock as an entirety the depreciation in value, as represented by list quotations in the last two months, is over three and one-half millions.

The case of Fox *vs.* the Hale & Norcross *et al.*, involving about $1,250,000, and which was recently transferred from Department 2 to the court in banc, will be argued this month.

According to financial statements filed on the 1st, the following companies had cash on hand on that date:

Alpha $8616.45, Best & Belcher $21,074.56, Chollar $10,413.31, Challenge $10,413.31, Church $16,459.65, Con. New York $3394.73, Con. Cal. & Virginia $47,899.29, Caledonia $6339.31, Confidence $4576.22, Exchequer $4698.47, Gould & Curry $5333.81, Mexican $736.68, Ophir $16,576.70, Overman $2715, Occidental $573.19, Seg. Belcher $124.11, Savage $3414.08, Union $3133.08, Utah $1559.03, Alta $6530.85, Bodie Consolidated $37,044.45, Belcher $17,046.17, Brunswick Consolidated $3444.22, Bulwer Consolidated $4902.01, Crown Point $14,402.68, Consolidated Imperial $2416.83, Hale & Norcross $26,180.01, Julia Consolidated $1385.75, Lady Washington $140.14, Mono $3467.26, Potosi $3524.78, Standard Con $37,920.29, Syndicate $940.36.

The following mining companies report having had an indebtedness June 30, 1894: Belle Isle $1536.90, Del Monte $29,760.38, Independence $246.10, Navajo $191.33, North Belle Isle $1701.93, North Commonwealth $1905.41, Silver King $292.

The following illustrates the changes of the week:

MINES.	28	5
Utah	.....	.....
Sierra Nevada	$ 56	.....
Union	31	30
Mexican	58	57
Ophir	1 70	1 55
Consolidated California and Virginia	2 80	2 65
Best & Belcher	99	96
Gould & Curry	53	51
Savage	34	30
Hale & Norcross	59	51
Chollar	23	25
Potosi	40	38
Bullion	.....	12
Exchequer	.....	.....
Alpha	.....	.....
Confidence	80	65
Yellow Jacket	40	.....
Crown Point	54	49
Belcher	59	59
Overman	14	11
Justice	10	11
Alta Consolidated	18	26
Consolidated New York	.....	.....
Challenge	32	30
Bodie	.....	1 45
Andes	42	38

Dividends for June.

So far as reported, the following mining companies declared dividends in June:

MINING COMPANIES' JUNE, '94, DIVIDENDS.

	JUNE.	*Total for year '94.*
Alaska-Treadwell, Alaska	$150,000	$ 225,000
American, Montana	.....	21,658
Aspen M. & S. Co., Colorado	20,000	20,000
Bald Butte, Montana	25,000	100,000
Belden Mica, N. H.	5,000	30,000
Boreel, Colorado	.....	500,00
Bullion B. & C., Utah	50,000	75,000
Central Eureka, Utah	.....	15,000
Calumet & Hecla, Michigan	.....	500,000
Champion, California	.....	17,000
Copper Queen Con., Arizona	50,000	150,000
De Lamar, Idaho	.....	200,000
Elkhorn, Montana	.....	32,813
Elkton, Colorado	5,000	35,000
Franklin, Michigan	.....	80,000
Golden Fleece, Colorado	.....	60,000
Golden Reward, South Dakota	.....	25,000
Golden Rule	5,000	10,000
Harqua Hala, Arizona	.....	36,000
Helena & Frisco, Montana	.....	15,000
Highland	10,000	25,000
Homestake, South Dakota	18,750	106,250
Hope, Montana	.....	25,000
Horn Silver	50,000	100,000
Iron Mountain, Montana	.....	20,000
Kennedy, California	.....	240,000
Mayflower Gravel, California	10,000	60,000
Mercur, Utah	25,000	150,000
Morning Star Drift, California	7,200	45,600
Moulton, Montana	.....	20,000
Moose, Colorado	21,200	45,200
Napa Con., California	.....	20,000
Omaha, Colorado	7,200	25,200
Quincy, Michigan	.....	200,000
Rico-Aspen, California	25,000	150,000
Smuggler, Colorado	.....	300,000
Standard Con., California	.....	20,000
Trinity River Hydraulic, Cal.	.....	12,500
Union, Colorado	6,000	12,250
Union M. Co., California	2,500	2,500
Victor, Colorado	15,000	45,000
W. Y. O. D., California	.....	15,000
Zion M. Co., Nevada	10.000	10,000
Totals	$435,350	$3,764,471

Twenty-five mines paid dividends in May, amounting to $885,100.

The above is by no means complete, as mail interruptions consequent upon the strike have delayed our regular reports.

Simple as the operation may seem, there is a way to clean windows and a way not to cleau them. The following suggestions may bc of use to some, as they save both time and labor: Choose a time when the sun does not shine on the wiudow, else it will dry streaked, and uo amount of rubbing can prevent it. Brush off all the dust inside and out. Clean the wookwork around the glass first. Use for this warm water and ammonia; do not use soap. Wipe dry with cotton cloth. Do not use liuen, as it leaves lint on the glass when dry. Polish with tissue or old uewspaper.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Deling't and Sale.*	*Secretary.*
Alta M Co, Nev	46	10c	May 14, June 19, July 10	J E Jacobus, 309 Montgomery
Bulwer Cons M Co, Cal	9	10c	May 24, June 29, July 27	L Osborn, 309 Montgomery
Conlon G M Co, Cal	2	5c	May 26, June 30, July 20	T Lynch, 26 Montgomery
Cons New York M Co, Nev	12	5c	May 11, June 19, July 12	C E Elliott, 309 Montgomery
Cons St Gothard M Co, Cal	9	6c	May 17, June 21, July 9	J F Holling, 113 Crocker Bldg
Eclipse M Co, Cal	8	2c	June 8, July 10, July 31	Otto Tum Suden, 530 California
Evening Star M Co, Cal	14	1c	June 5, July 14, Aug 4	J J Scoville, 320 Sansome
Mexican G & S M Co, Nev	50	25c	June 12, July 17, Aug 7	C E Elliott, 79 Nevada Block
Occidental Con M Co, Nev	16	10c	May 31, July 5, July 31	A K Durhrow, 69 Nevada Block
Seg Belcher & Mides M Co, Nev	14	10c	June 12, July 16, Aug 6	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	10	20c	May 2, June 11, July 9	J W Pew, 310 Pine
S Eureka M Co, Cal	11	1c	May 15, June 25, July 16	A Halsey, 328 Montgomery
Union Cons M Co, Nev	49	15c	June 20, July 25, Aug 15	C C Harvey, 309 Montgomery
Virginia Cons M Co, Cal	11	½c	May 14, June 20, July 16	A F Benard, 26 O'Farrell

MEETINGS.

Company and Location.	*Meeting.*	*Secretary and Office in S. F.*	*Date.*
Best & Belcher M Co, Nev	Annual	M Taffe	July 9
North Star M Co, Cal	Special	D A Jennings	July 10
Overman S M Co, Nev	Annual	W H Blanvelt	July 12
Union Cons S M Co, Nev	Annual	C C Harvey, 309 Montgomery	July 16
Yellow Jacket S M Co, Nev	Annual	G D Edwards, 414 California	July 16

San Francisco Stock Board Sales.

SAN FRANCISCO, July 5, 1894.

FIRST SESSION—11 A. M.

300 Alta	20	200 Gould & Curry	51
400 Belcher	53	500 Hale & Norcross	51
100 Best & Belcher	96	200 Jackson	20
100	95	100 Mexican	55
400 Bodie	1 00	100	54
150 Bullion	12	100	53
50	11	100 Ophir	1 50
100 Challenge	30	100	1 55
300 Chollar	24	200	1 45
20 Confidence	65	200 Overman	10
100 Crown Point	47	200 Potosi	38
400	46	200 Savage	30
200 Con Cal & Va	2 55	100 Union	30
200	2 60		

SECOND SESSION—2:30 P. M.

400 Alta	26	100 C. C. & Va	2 65
100 Andes	38	100 Crown Point	49
200 Belcher	59	1000 Julia	3
100 Bodie	1 40	350 Justice	11
250	1 45	150 Mexican	57
400 Bullion	11	200 Mono	35
100 Bulwer	25	400 Ophir	1 55
100 Chollar	25	200 Overman	11

It is trial that proves one thing weak and another strong. A house built on the sand is, in fair weather, just as good as if builded on a rock. A cobweb is as good as the mightiest cable when there is no strain upon it.—H. W. Beecher.

The less water there is in a bottle, the more noise it makes coming out. Some men are like bottles.—Anon.

It is not enough to have great qualities; we should also have the management of them.—La Rochefoucauld.

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The World's Gold and Silver Production for 20 Years.

The changes in the world's production of gold and silver during the last two decades are shown in the following table, which is taken from the last report of the Director of the Mint, with the exception of the figures for 1892, which are revised in accordance with Mr. Preston's estimates, and the figures for 1893, which are taken from his report just submitted to Congress:

PRODUCTION OF GOLD AND SILVER SINCE 1873.

Calendar years.	Gold.	Silver coining value.
1873	$36,200,000	$81,800,000
1874	30,750,000	71,500,000
1875	37,500,000	80,500,000
1876	103,700,000	87,600,000
1877	114,000,000	81,000,000
1878	119,000,000	95,000,000
1879	100,000,000	96,000,000
1880	106,500,000	96,700,000
1881	103,000,000	102,000,000
1882	102,000,000	111,800,000
1883	95,400,000	115,300,000
1884	101,700,000	105,500,000
1885	108,400,000	118,500,000
1886	105,000,000	120,600,000
1887	105,775,000	124,281,800
1888	110,197,000	140,705,000
1889	123,480,000	162,150,000
1890	118,848,700	172,234,500
1891	120,183,500	189,446,800
1892	146,297,600	197,230,500
1893	155,521,700	207,895,400

It will be seen from this table that the value of the gold produced in the world in 1893 exceeded the value of that produced in 1873 by nearly $60,000,000, while the coiniug value of the silver produced in 1893 exceeded that of the silver produced in 1873 by over $126,000,000. Of course it is to be recollected that the commercial value of silver has not kept pace with its coining value in the two decades that that have elapsed since 1873. It will be noticed also that the increase in the value of the silver product has been on the whole more steady than that in the value of the gold product. The increase in the production of gold since 1873, it may be remarked, has been altogether owing to other countries than the United States, for the product of the latter country in 1893 was actually a trifle less thau that for the year 1873.

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Emigration from the United States.

In an interview with a reporter of the New York *Sun* the representative of the Hamburg-American line declared the number of steerage passengers going to Europe from this country within five months was surprisingly large as compared with the same period of 1893. In the case of the Hamburg-American line the increase has been almost 80 per cent. The representative of the Anchor line reported that the exodus by his line had never been equaled, and was 125 per cent greater during the first five months of the present year than during the same time in 1893. One of the vessels of the Red Star line on her last voyage brought in 80 immigrants and returned with 450. The French line reports almost the same condition of affairs. The North-German Lloyd, while not carrying so many eastward as some of the other lines, reports a decline of about 100 per cent in the westward-bound emigrant traffic. The Cunard line's eastward emigrant business increased about one-third over the figures of last year for the period named. This is the first year in the history of the traffic when the outgoing steerage passengers outnumbered the incoming.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

DIVIDEND NOTICE.

The German Savings and Loan Society,
526 CALIFORNIA STREET.

For the half-year ending June 30, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after MONDAY, July 2, 1894.

GEO. TOURNY, Secretary.

CLEAR CREEK, OREGON.

The First CRAWFORD Mill in Oregon has been erected at the Red Boy mine. Trial run of 22 days showed 220 tons treated, yielding over $200, bullion, a saving of 85 per cent. Wear and tear, 20 cents per ton. No plates or screens. Simplest, cheapest and most economical mill on the market. *Special terms offered the first mill introduced in any mining district.* Oregon Agent, E. J. GODFREY, Baker City. Full particulars from

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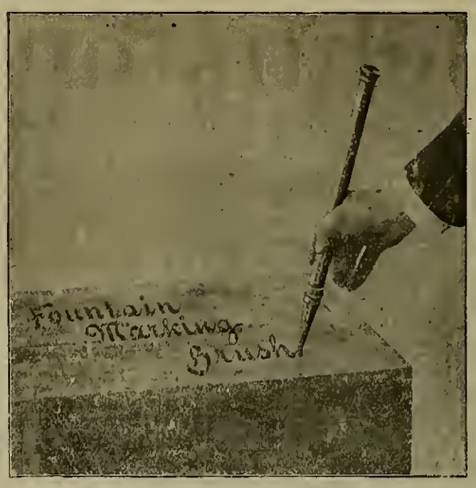

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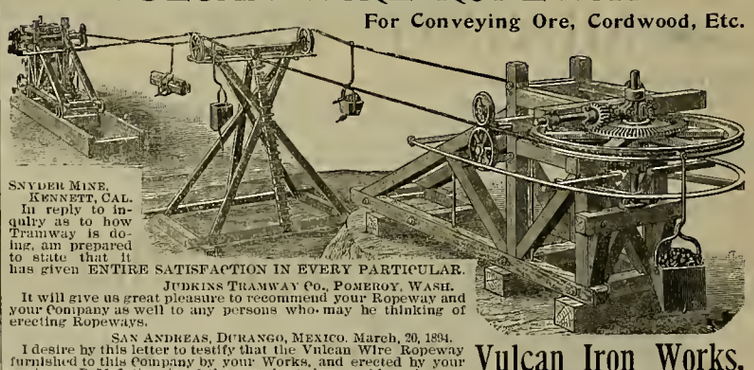

SNYDER MINE, KENNETT, CAL. In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.

JUDKINS TRAMWAY CO., POMEROY, WASH. It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.

SAN ANDREAS, DURANGO, MEXICO. March, 20, 1894. I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation. ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

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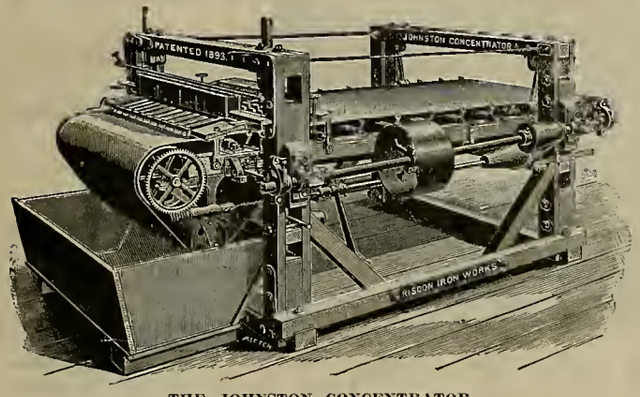

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[Signed.] By LEON SLOSS.

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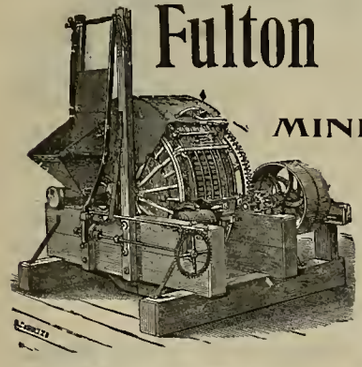

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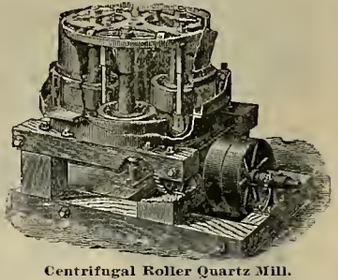

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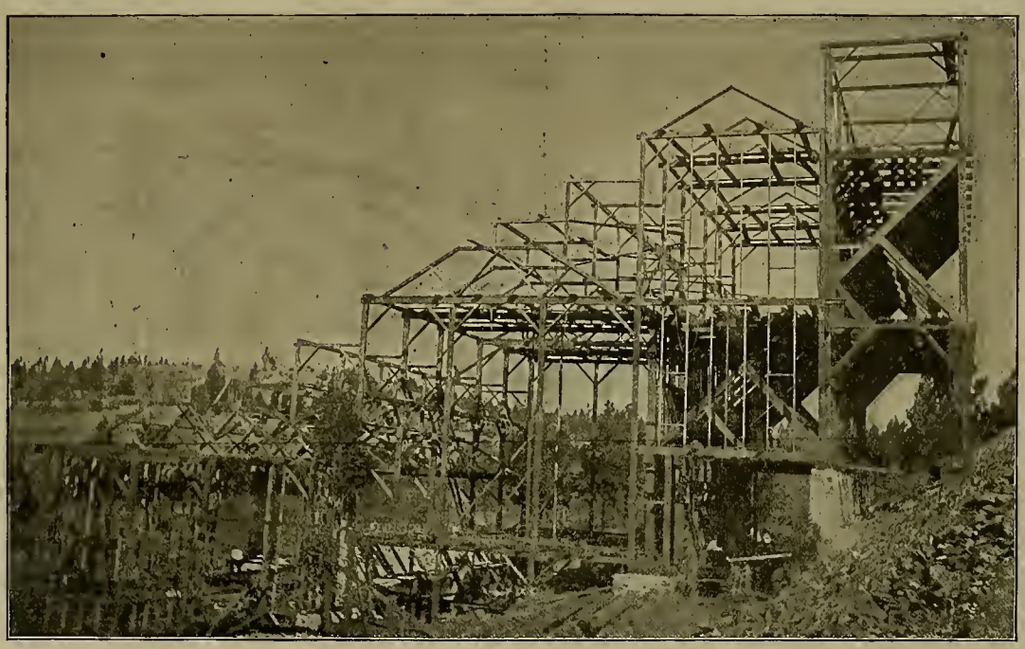
VOLUME LXIX. Number 2.

SAN FRANCISCO, SATURDAY, JULY 14, 1894.

THREE DOLLARS PER ANNUM Single Copies, Ten Cents.

CONSIDERABLE stress is laid on the fact that the hundred-million gold reserve is cut down to 64,000,000, and wonder is expressed by Secretary Carlisle and others as to the best means of preventing such depletion. As the Treasury Secretary is credited with an unwillingness to issue any more bonds (which is virtually putting a premium on gold), it is in order to suggest how he can at least check daily depredations in the Treasury reserve. The popular supposition is, that the "hundred-million reserve" is kept separate from other Government Treasury assets. It ought to be, but it isn't. The check to the lowering of the gold reserve is to act in the interests of the Government, and not in the interests of those who make the matter one of traffic and speculation. The Secretary of the Treasury has fallen into the careless habit of using the proceeds of the gold reserve to pay the excess of expenditure. The practice is a loose one, and is not consonant with ordinary rules of private business integrity. The legal tender notes which are redeemed from the gold reserve are turned into the general fund, which is simply a proclamation to all and sundry of a way to increase the public indebtedness. Secretary Carlisle, if he wants to, can at any hour begin to put a stop to such perversion of law and common sense by holding the legal tenders as they are presented and redeemed, constituting them a part of the reserve till they are called for in exchange for gold, when they would be reissued. This is what was contemplated by the law when framed. Were Mr. Carlisle to so naturally and fairly interpret the law, the demand for gold upon presentation of such legal tenders would not be of long continuance, such action being checked by the contraction of the note supply. Just so long as speculators can draw out gold and greenbacks both, just so long will the drain go on and the "reserve" be in such a state of depletion as to threaten the necessity of another issue of bonds. The dispatches of the week announce that during the fiscal year ending June 30th the public debt has increased over $50,000,000. This is largely due to the present system of handling the gold reserve, a pernicious practice which could be changed as indicated.



NORTH STAR MILL IN PROCESS OF CONSTRUCTION.

NORTH STAR MINE, GRASS VALLEY, CAL. — *See page 42*

RECENT reference was made to a long letter sent to the U. S. Debris Commission by the Anti-Debris Association, in which that organization made proffer of their paid spies. Fitting and dignified response has been made the proposal, in which is the following paragraph: The Commission expresses its obligation for your offer to place at its service certain of your employes, without cost. Whenever an occasion shall arise making it expedient to accept this offer, the Commission will be under further obligation.

THE annual report of the Secretary of Mines of Victoria, Australia, for '93 is received. There is a little new statistical and general information in it, the space being largely devoted to descriptions of American mining machinery, taken from the columns of the MINING AND SCIENTIFIC PRESS and other mining journals. The gold yield of the colony for the year was 671,127 ounces, an increase of 16,670 ounces as compared with '92.

IN the ordinary acceptation of the term "a mine" is a mineral claim or location, though strictly speaking it is subterraneous work with the object of extracting metal ore, or other mineral substance. It is clear that the word "mine" can not be correctly applied to an undeveloped claim, though it is usual to speak of such a claim as a mine, the same as of a real "mine" on which work has been done, and on which are buildings, machinery, and mining appliances. There have been over 40,000 mining claims taken up and recorded in Nevada, and probably as many more in California, but the number of actual "mines" in the two States would hardly require five figures to express them. This is one of the cases where there is a distinction with a difference.

AT the beginning of the present deplorable public trouble, United States Attorney-General Olney gave an interpretation of the Government mail laws that implied a Pullman car was as necessary as a two cent stamp to rail transmission of a letter. United States Attorney Denis of Los Angeles subsequently made a ruling directly in opposition to his superior, but manifestly more in accordance with the plain rights of the public, to the effect that the Southern Pacific Company must move the mails without Pullmans, if the latter cars could not be handled. It is not probable that Attorney Denis will hear harshly from Washington. Even this Administration must certainly fail to see that Olney's dictum cannot stand, and that the rights of the American people cannot be checked by attempted Government complicity with the strained interpretation of Government contracts.

EVERY report from the South African gold fields is to the effect that so far as concerning men who work for wages, that country is a poor place for white men. Native labor is very cheap, and many men who have gone to South Africa in search of work at living wages are reported destitute and desirous of getting away.

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Our latest forms go to press on Thursday evening.

San Francisco, July 14, 1894.

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THE railroad paralysis has occasioned a general revival of days and means of thirty years ago, and boats, stages and horseback have been utilized for the last two weeks in mail and passenger communication throughout the State.

THE admission of Utah, which but awaits the President's signature, will be of direct benefit to the mining resources of that section. Had it not been for Mormonism, and other political complications, Utah would have been in the Union twenty years ago, and her admission now is but an act of deferred justice to a prosperous and prominent part of the nation.

THE present railroad paralysis makes many things expensive and inconvenient for dwellers and sojourners in the mining regions and elsewhere. Mail is slow, provisions higher, and transportation expensive. A private letter from Boulder Creek, Santa Cruz county, says that one man paid $30 for a conveyance to take him from there to Santa Cruz; another gave $70 to be taken to Haywards, a distance of eighty-one miles. The only people in California at all favored in these troublous times are dwellers on lines of water travel.

THE Goldbank mine at Forbestown, Butte county, is a good example of what patient development can do. The owners of the property had the nerve and financial ability to stay with it, and though they were out $150,000 before it began producing, their expectations have been amply justified. It is calculated that there is now at least four years supply of ore in sight. The ledge averages from five to twenty-five feet in width. About 100 men are now employed. It is the intention to run a tunnel on a lower level, avoiding the hoisting, and build a much larger stamp mill lower down the canyon from the site of the present forty stamp mill.

IT had been proposed to take steps toward retaining for permanent and appropriate exhibition in this city the splendid exhibits from the several mining counties at the Midwinter Fair, but it was finally decided to return all the ore to the counties from whence they came, that proving to be the generally expressed wish of the donors. The model quartz mill near the south entrance to the Mechanic Arts Building has recently crushed some of the rich ore which the State Miners' Association did not care to remove, and it is proposed to have a gold medal struck from the product in commemoration of the greatest mining display ever made in California, or, probably, the entire world.

A Case of Interest.

Wyoming Con. Mining Co. vs. Champion Mining Co.

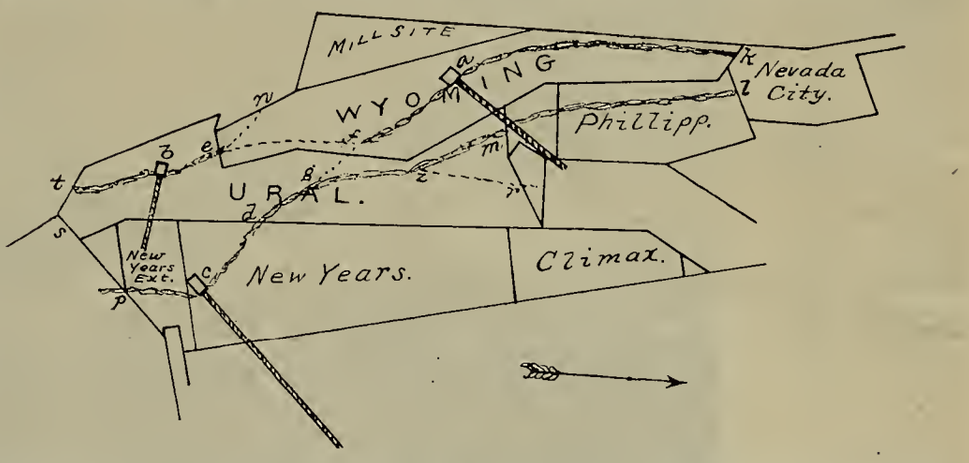
This cause, which was tried before Judge Hawley, U. S. Circuit Judge of Nevada, sitting for Judge McKenna in this city in the month of May, regarding mining property in Nevada county, California, involves a number of fine legal points, questions of fact, however, being woven into the cause.

A brief statement of the cause and contentions as developed on the trial may be given as follows: The plaintiff sues for an injunction to restrain defendant from working on a vein claimed by plaintiff and for an accounting for the value of ores claimed to have been removed.

The plaintiff is the owner of the claims shown on diagram as the Wyoming and Ural, title U. S. patent, issued subsequent to May 10, 1872, but based on locations prior to that date.

The defendant is the owner of the New Years and New Years extension claims. Title U. S. Land Office Receiver's receipt for a patent, based on locations subsequent to May 10, 1872. There is no conflict as to surface rights.

In the year 1885 these same parties were involved in litigation, the cause being tried in the Superior Court of Nevada county, the judgment of the court being affirmed by the Supreme Court of California. The litigation then being as to the rights of the Phillipp claim owned by defendant and the Wyoming claim, but all of the property involved in the present action was also included in the former action, and the judgment in said cause was introduced by plaintiff.



Extending through the claims of both parties is the apex of a vein known as the contact or Ural vein, dipping to the east, with granite for a hanging and slate for a foot wall; shown on the diagram at *p*, *d*, *m*, *l*. Crossing the line between the Ural claim of plaintiff and New Years claim of defendant at point *d*, and crossing a north line of the Ural claim at the point *m*. A branch of this vein extends into the granite from *z* to *r*, crossing line *r*. At the point *c* the defendant has sunk an incline shaft on the contact vein, 1000 feet deep on the dip, and has worked extensively the vein.

Lying to the west of the contact is a vein which near the surface is entirely in the slate, and is known as the Wyoming vein. On this vein the plaintiff has sunk the incline shafts *a* and *b*, with extensive underground works. The works of the shaft *b* of plaintiff on Wyoming vein, intersecting the works from the defendant's shaft *c*, on contact vein. Plaintiff claims that the apex of the Wyoming mine follows the line *t*, *b*, *e*, *f*, *a*, *k*; and that said Wyoming vein on its dip unites in depth with the contact vein, and forms a junction therewith.

The defendant denies the existence of such a junction, and claims the apex of the Wyoming vein to be two distinct portions, following the line *t*, *b*, *e*, *n*, and the line *g*, *f*, *a*, *k*.

The contentions of the plaintiff are that it is entitled to: First, the Wyoming vein, from the point *k* to *e*, with the right to follow said vein on its dip to any depth within perpendicular planes passed through the end-lines *k* and *e* and their continuation, also to the united vein below its junction with the contact vein. Second, to the contact vein from the point *m* to the point *d*, with the right to follow said vein on its dip; being limited by a perpendicular plane passed through the line *r*, and a perpendicular plane passed through the point *d* and parallel with the line *r*. Third, to the Wyoming vein, from the point *t* to the point *e*, with the right to follow said vein on its dip, within a perpendicular plane passed through the line *e*, and a perpendicular plane passed through the point *t* parallel with the line *r*, until said latter plane intersected the line *s*, *p*, when it should be followed.

The contentions of defendant were: That said Wyoming vein does not unite on its dip with the contact vein. That the plaintiff has no right to follow the Wyoming vein outside of the side lines of said Wyoming claim, because the end lines of said claim are not parallel, and that the vein passed through a side line, and has no extra lateral right on the dip of said vein. That the line *d* is the end line of plaintiff on the contact vein, and that the plaintiff has no right to follow said contact vein, or portion of Wyoming vein, outside of the side lines of the Ural claim, because the end lines are not parallel and that the vein passes through a side line. That when the defendant obtained the Receiver's receipt of the Land Office, it was equivalent to a patent, which gave a new title to property of defendant, to which the former judgment in previous action does not relate, and hence could not be set up as a bar in this action.

These are the principal points involved in the actions which are before the court, the decision of which will be looked for with interest by mining men, as the points are allied closely to recent decisions.

THE latest events in the great strike remove the matter from the domain of public right or private wrong, to the wider one of rebellion and civil war. It would seem that the ballot is preferable to the bullet, and that it is far better every way to outvote people than to outfight them, particularly when every one who ought, and a good many who oughtn't, have the votes. But, in such a crisis as the present, there is but one course for every man—either train with those who are for law and order, or with those who plot murder and treason. There is no midway ground. Men have been killed in this State and elsewhere—not by "accident," as some publications cowardly assert, but by deliberate assassination—while in discharge of their plain duty, and the echoes of corporate greed or organized opposition are lost in thunder from the dark cloud of anarchy. We are American citizens, and our claim to that proud title must be vindicated by our readiness to acknowledge the supremacy of law.

THE published reports from the South African mines have deterred many Californians from emigrating to that far-off land, rightly concluding that "'tis better to endure the ills we have than fly to others that we know not of." To a man without large capital or great natural ability the South African fields offer little encouragement for success, and to the man with either or both, success is assured by less effort here.

THOUSANDS of visitors still daily throng the site of the late Midwinter Fair. The buildings are being stripped of their contents and but little will be left to see after next week.

Concentrates.

THREE ten-stamp quartz mills are reported being put in at mines at Alleghany, Sierra county.

A LARGE roaster and chlorination plant has been added to the Yarnell mine, Yavapai Co., Arizona.

THE weekly output from the Broken Hill Proprietary mine, New South Wales, is 300,000 ounces of silver.

DURING the mail famine, city papers have sold as high as $1.50 a copy in several isolated communities.

THE Starlight Mining Company has incorporated; capital stock $100,000, of which $27,750 has been subscribed.

THE water in the Yuba river is unusually clear, showing that comparatively little debris from the mines is held in solution.

HUGH GRANT, a well-known miner, was killed by a blast in the Golden King quartz mine on Kanuka creek, Sierra Co., last Saturday.

THE Derbec Mining Company has finished a survey for a ditch to Canyon creek, ten miles above Washington. The cost will be $300,000.

D. BOYLE, owner of the Lone Pine group of gold mines, has sold his placer claims, lying between Skull valley and Walnut Grove, for $75,000.

A GOLD nugget weighing 28¾ ounces and valued at $500 was recently found by E. Cook in the mining claim of Cook & Murphy at Kelsey.

BY a vote of 402,722 Nevada county was awarded the silver cup offered by the San Francisco *Chronicle* for the best mineral exhibit at the Midwinter Fair.

THE Nugget mine and mill at Gila City is to be put on a paying basis. A new boiler will be put in the mill and the machinery given a thorough overhauling.

IN JULY $70,000 mine assessments fall due; of the amount $9000 is asked for three California mines; the remainder for eight in Storey county, Nevada.

A MILL to refine sulphurets will be erected at the Lewis mine, near Mt. Reuben, Or. There are sulphurets to the value of $40,000 piled up at the mine.

FOR the first time in thirty years merchandise is being freighted by team from Sacramento to Grass Valley. By rail it would be $8.50 per ton; by team it is $20 per ton.

THE *Union* says a small crushing of ore from the Rose Hill mine just put through at the Gauthier mill, yielded about $77 per load, saying nothing of sulphurets which are worth $250 per ton.

THE Parrott mines and smelter at Butte, Mont., have closed for lack of fuel and cannot resume until the Union Pacific is open. Some of the Anaconda Company's mines have also closed.

THE Middle Feather River Gold-Mining Company has been incorporated in Oakland. The capital stock is $500,000. The directors are S. A. Stevens, W. S. Steveus, J. R. Scupham, E. S. Irvin, A. M. Rugg and H. Smith.

FIFTY-TWO AND ONE-HALF ounces of amalgam were retorted from the Pennsylvania mine, near Grass Valley, recently. The gold was from a crushing of 46 tons of ore from the mine, giving a yield of about eighteen dollars and a half per ton.

ON June 27th there were nine counties without railroad connection with the rest of the State, viz.: Modoc, Plumas, Lake, Tuolumne, Mariposa, Alpine, Trinity, Humboldt and Del Norte. Since then the number has been greatly increased.

THE Poorman mill at Silver City, Idaho, was burned to the ground on the 4th. The fire broke out at 8 P. M., and there was no means at hand to fight the flames. It was a total loss. There was no insurance. It was a 20-stamp mill, worth $40,000.

A DISCOVERY of rich placer ground is reported on Cariboo creek, 20 miles from Nakusp. Coarse gold was found in abundance, each pan running from 25 cents to $1.25. The gold has apparently not traveled far, as points can be discovered on it with the naked eye.

A CRIPPLE CREEK, COL., dispatch of the 11th says: "The richest ore ever seen here was turned up in one of the mines to-day. The streak varies in width from two to four inches. The free gold is malleable and is in sheets as large and fully as thick as a five-cent piece."

BIRDSEY, KNOTTS & SWINDEN have sold their ledge in Kane's Creek district, southern Oregon, to Chapman Bros. of Oakland for $20,000. They will put a mill on the property. The ledge is three feet wide at a depth of 30 feet, and the ore is free-milling. The old company retains the quartz already mined and also the privilege of sluicing the surface.

ANOTHER "gold excitement" is reported on the Gila river, sixty miles east of Yuma, where it is asserted the old bed of the Colorado has been found in which is located a belt of gold-bearing gravel sixty miles in length by one to two miles wide. Prospecting shafts are now being sunk to reach the pay streak, which is believed to be eighty feet below the surface.

THE Escondido mine has temporarily suspended operations. It is reported that work will be resumed under a new management, under which the mine will be exploited in a systematic manner. The Escondido mine is one of the oldest in the State, and, according to tradition, was worked before Fremont came to California. It is situated in the center of a wheat field, two miles from the town of Escondido.

THE State Anti-Debris Association has made complaint against the North Bloomfield Mining Co., alleging that it is discharging tailings and debris into the South Yuba contrary to law. Similar complaint has also been made by that association against C. and J. O'Connor of North Bloomfield. The United States Debris Commission has sent official notice to the parties complained of, calling attention to the requirements of the Act of March 1, 1893, and requiring them to cease mining by the hydraulic process.

W. T. PHIPPS, manager of the State Anti-Debris Association, took samples of the waters of the Yuba river at the D-street bridge recently and he is very much pleased with the condition thereof, there being comparatively little debris held in solution, says the Marysville *Democrat*. The stream is clearer than it has been for several years. N. E. Boyd, chief of the watchmen in the employ of the association, came down from the headwaters of the Yuba river lately, and he reports that no debris of any consequence is being washed into the stream, which is the cause of the present condition of the water. The only mines now in operation are the Excelsior at Smartsville and the Bloomfield, which are depositing very little, if any, detritus in the stream.

THE chicken with gold in its gizzard, annually reported from Grant's Pass, is this year outdone by Banker Hellman of Los Angeles, who has eucalyptus trees at Cucamonga, Cal., in the bark thereof "tiny specks of gold" having been discovered last week. Hellman's manager's theory is that "capillary attraction caused the sap to carry the gold up from the earth." The dispatch says: "The matter has been kept quiet and has caused no excitement." That's good. Excitement is always fatal to such processes of gold deposition.

THE once-famous Catholic mine in the Santa Ynez mountains, in Santa Barbara county, is reported re-discovered. This mine was operated by the Spanish padres, it was exceedingly rich in free ore, and has been lost since 1850. The location of the mine has been kept a secret until Henry Stewart claims to have recently stumbled upon it. He says that it contains free gold in the rock, which is easy to work. As soon as claims have been taken up it will be worked. Several men have gone to the locality to stake claims. Specimens of free gold are large and remarkable for the purity of the ore.

ONE singular result of the strike has been the protracted closing down of the U. S. Mint in this city. On June 16th, Supt. Daggett shut off the receipt of crude bullion, and on the 23d stopped receiving refined bullion, not because of any labor trouble, but in usual accordance with the annual custom of suspending operations till the arrival of the government representatives who were on the way. The strike tied them up at Ogden, and till they arrive and make the regular annual examination and settlements the big government coin factory at 5th and Mission is idle. Even a government mint doesn't make money these times.

THE following is related as a fact by the Australian *Mining Standard* and goes to show that the gold fever has got a pretty tight hold of South Australian people. It occurred in a north-eastern town, and the occasion was a prayer meeting. One brother was holding forth, and he spoke thusly: "Lord bless this meeting. Bless all the brethren who are present. Bless those who are absent. Bless all the young people. Bless this town, and——" Here one of the worshipers interjected—"What about the cyanide process?" "Aye," went on the prayerful person, who probably had an interest in some gold claims in the vicinity, "Lord bless the cyanide process." To this there came as a response a unanimous "Amen," and the speaker got up and brushed the dust from off his knees.

THE one hundredth man with a sure process for separating the gold from the black sand along the coast has appeared in Isaac Banta of Albany, Oregon, who claims his method is a success. A long sluice is used, with a hopper and sieve, to keep out the larger debris in the sand. The chemical preparation is then placed in the bottom of the sluice-box, which collects or precipitates the fine gold in the bottom of the box. It is claimed that men who used to get 75 cents to $1 a day by the old processes are now taking out as high as $5, and even, under favorable conditions, $18 per day. Thirty-five men are reported at work on South beach between Yaquina and Alsea, and most of the claims are taken for 14 miles down the beach. The owners have gone to Port Orford to put some machines to work there, and several miners have gone up the coast as far as Tillamook.

Clipped and Condensed.

THE cholera has reached Belgium and England.

THE United States flag has forty-five stars. Utah is a State.

WELLS, FARGO & Co. say this strike is costing them $10,000 a day.

IT is figured that the maintenance of the State militia at Sacramento costs over $4000 a day.

NEARLY all the main buildings of the Chicago World's Fair have been totally destroyed by fire.

DURING the week the English yacht Britannia defeated the American yacht Vigilant in three races in British waters.

FOR a four-hours' argument in a law case at Indianapolis, Ind., last Wednesday, ex-President Harrison received a $25,000 fee.

A SECOND cloudburst swept away in the town of Conconnully, in the Okanogan mining district, on the 5th, all that was left standing after the cloudburst of last May.

THE chemical works of Williams & Clarke at Carteret, N. J., said to be the largest in the world, were almost destroyed by fire last Wednesday. The loss approximates $500,000.

BY a ruling of the House of Representatives, the claims of five San Francisco banks, aggregating $825,633, have been refused. The banks lost that amount by the fraudulent issue of naval supply certificates by inspector Spalding.

IT is reported at Guaymas that the Achison, Topeka and Santa Fe Company has leased its Sonora line between Benson and Guaymas, on the Gulf of California, to George Douglas of Mazatlan, a capitalist who owns a line of steamers on the gulf.

THE cannery of the Astoria Packing Company, M. J. Kinney principal owner, the largest salmon cannery in the world, was totally destroyed by fire last Saturday. The loss is estimated at $70,000, including nearly 10,000 cases of salmon ready for shipment; insurance, $40,000.

THE tide of emigration is setting back to Europe and away from the United States. This has never happened before or since the first statistics of emigration and immigration were made in 1820. In the six months ending last Saturday, the arrivals of immigrants have been 66 per cent of the departures.

CONGRESSMAN MCGANN, chairman of the Committee on Labor in the House, has a bill framed for avoiding strikes, which he will present to President Debs, A. R. U., President Gompers of the Federation of Labor, and the heads of large railway and other corporations. The plan contemplates a contract between employes and employers, by which each will agree to submit their differences to arbitration.

SERIOUS trouble has been reported from the Cœur d'Alene mines during the week, the towns of Wallace and Wardner and vicinity being terrorized by rioting miners whose policy seems to be to take advantage of the railway and labor troubles to make as much additional confusion as possible. Business of all kinds was paralyzed, all the mines shut down, a sheriff's posse organized and a call made for troops. On Saturday morning an attempt was made to blow up the powerhouse and electric-light plant of the Bunker Hill and Sullivan mine, sticks of dynamite having been exploded under the building, partially wrecking it. On the hills above the powerhouse were massed the rioters, rolling boulders, slag and logs down on the mines and buildings. Governor McConnell asked for troops, which were furnished from Vancouver. The Governor offered $1000 reward for the conviction of the murderers of the blacksmith, John Kneebone, at Gem on the 3rd, a crime that was witnessed by 150 people. The row is the aftermath of the Canyon Creek slaughter, two years ago. That event was solemnly commemorated on Wednesday by a parade of 730 men at Wallace, Idaho, and 790 at Spokane, Washington. Flowers were strewn on the graves of the rioters killed July 11, 1892, and speeches made, the real object of the demonstration being a display of numerical strength.

THE progress and status of the great strike since our last issue is thus summarized: In Chicago, the storm center, a maddened mob on Saturday destroyed hundreds of cars with their contents; six persons were killed and several wounded; firemen were beaten, hose cut, tracks torn up, the rioters being dispersed by Illinois State troops. Debs issued a proclamation of peace. In this State the California National Guard were in camp at the State Capitol in Sacramento, the A. R. U. was in possession of the depots at Sacramento, Oakland and Los Angeles, and no trains moved. The strike had spread as far east as Buffalo, N. Y. On Saturday night President Cleveland issued a proclamation virtually declaring martial law in Chicago and the State of Illinois. At Hammond, Indiana, just across the Illinois State line, there was deadly conflict, and at several other points armed disturbance took place. On Monday all local efforts at arbitration failed, both parties to the matter declining to entertain any proposition for mutual consideration. By Monday night the Santa Fe and Union Pacific had succeeded in moving trains eastward, the Northern Pacific and Great Northern had a desultory service, the Southern and Central Pacific were still tied up, the only property of theirs moving in the State being the boats on the bay and river. U. S. Dist. Att'y Denis, at Los Angeles, notified the S. P. officials that they must run mail trains irrespective of any complications regarding Pullman cars. On Tuesday morning President Cleveland issued another proclamation covering the entire western half of the continent, commanding all persons engaged in or connected with "unlawful obstructions, combinations and assemblages, to disperse and retire peaceably to their respective abodes on or before 4 o'clock of the afternoon of the 10th day of July." On Tuesday trains began to move at Chicago, and regular army troops repelled nearly all riotous tendency. Throughout Tuesday further efforts were made by various commercial organizations to secure arbitration, but unsuccessfully. The presidents of the various great labor organizations threatened to order a general walkout of every labor union in the country thus controlled. The United States troops in and around San Francisco were set in motion under command of Gen. Ruger, the *Monterey* and *Charleston* put under orders at Mare Island, and a detachment of the regular army started for Sacramento on the Alameda. At Sprague, Wash., there was a riot on the Northern Pacific, resulting in the destruction of some property and the demoralization of a part of the Washington State Militia. Tuesday was a period of general discussion all over the country as to the likelihood of a general strike, as the K. of L. and the Federated Trades had joined the A. R. U. in its determination to see the end on the lines originally laid down. On Wednesday came the climax. Up to that time there had been since June 8th a daily loss to the general people of California of a million dollars, to the S. P. Co. $200,000, and to the railway's employes $25,000. The loss to the nation would, doubtless, aggregate $10,000,000 daily. Prest. Debs of the A. R. U. and three associates had been arrested at Chicago, and released on bail, General Master Workman Sovereign of the K. of L. had called out that organization, comprising, it was claimed, directly and indirectly, 1,000,000 men, and President Gompers of the Federated Trades had expressed his sympathy with the idea, the regular army was in possession at Chicago and elsewhere, trains arriving and departing regularly wherever they appeared, it being generally realized that resistance to the Federal troops meant treason to the Government. On Wednesday throughout the nation the general order of Sovereign fell flat, less than five per cent of the men going out, mostly in Chicago. The K. of L. leaders claim that when the local unions act the order will be effective, and that to-day there will be a general walkout of labor unions in every State. East of the rocky mountains trains were moving on all roads with partial regularity. There was still trouble at Hammond, Indiana, and in Chicago dynamite was exploded in the Illinois Central car shops, and two attempts reported on the life of Vice Prest. Wickes of the Pullman Car Co. The climax of lawlessness was reached in this State. The U. S. regular troops reached Sacramento at daylight, took possession of the railway depot, a train was made up for this city and started at noon. When three miles out it was derailed and sent crashing over a trestle into fifteen feet of water. The engineer and four soldiers were killed, and several wounded. The uninjured cars were brought back to Sacramento. The crime was charged to the strikers, and four men found in the vicinity of the wreck were arrested. The penalty for train-wrecking under the State statutes is death. The A. R. U. leaders disclaimed any connection with the crime. The relation between cause and effect is very close. Shots were exchanged between sharpshooters on both sides in Sacramento. The general expectation was that a deadly collision there was inevitable. In Philadelphia the K. of L. demand the impeachment of Attorney-General Olney, and in Cleveland, O., they ask that President Cleveland be impeached. In Ft. Wayne, Ind., and elsewhere, the newspapers have been warned by the A. R. U. that adverse comment on its actions will result in their being "boycotted." Arbitration is still advocated by cool-headed men on both sides. At this writing it appears that the strike has culminated; that public opinion is for the supremacy of the law as its exists, with a view to its future alteration, and that a guerilla warfare on railway property will continue for a week. Up to yesterday morning there was no strike of any California labor organization in sympathy with the A. R. U., the general feeling among employers and employes being that arbitration could and should settle all present differences. Outside this State the strike is considered as being over.

Resume of the Mineral Industry of California for 1893.

Compiled by the Statistician of the State Mining Bureau, under the direction of J. J. Crawford, State Mineralogist.

California continues to he the leading gold-produciug section of the United States, a position it has held since the discovery of the precious metal within its borders. In comhined gold and silver product, California is only exceeded hy Colorado and Montana, they beiug the largest silver producers, but in gold this State is still first, leading all others by six or seven millious of dollars annually.

It is highly prohable, moreover, that the gold product of the State will he materially increased during the next few years, owing to the partial rehahilitatiou of the loug dormant hydraulic mining industry, and the renewed interest in gold mining generally, due to the decline in silver and lead mining. As this State has the largest available area of auriferous country, it is here that those who have ahandoned silver mining will naturally come in search of gold properties.

The gold product of California for this year is betweeu $12,000,000 and $13,000,000. In 1892 it was $12,571,900. In 1893 the statistics of John J. Valentine, President of Wells, Fargo & Co., gave a precious metal outpnt of $13,096,948. Of this $257,-005 was silver and $1,667,907 in "ores and base bullion hy freight." As our lead product is only 300 or 400 tons a year, the other ores were mainly gold, so that the gold ontpnt for 1893 may he fairly set down, from the foregoing figures, as above $12,-500,000.

During the very thorough investigation made for the recent censns, the gold and silver product of the State was found to he for that year $13,960,529. The statistics were persoually collected hy agents, who visited all the mines throughout the State. This sum was above the usual estimates, and showed that the State was really produciug every year more than it was credited with. The investigation also showed that the precious metal mines of California returned in bullion $1 for each $5.12 invested. The iuvested capital is $71,934,968. In these figures the great hydraulic mines draining into the Sacramento and Sau Joaquin rivers were not considered, as none of these were in operatiou during the censns year. In the section referred to, an investment of $100,000,000 has been made in this class of mines, but this has been an unproductive industry for mauy years, for reasons stated elsewhere in this chapter.

Gold and silver are found and mined to a greater or less extent in forty of the counties of this State, and largely in more than half that number. Although the silver product of the State has been sometimes as high as two and a half millions, it is now only a few hundred thousands annually. The principal silver mines are iu the sothern part of the State, while the principal gold mines are in the northern and central part. It is in gold that California has earned her repntation as a mining region, as it was that which originally caused the settlement of the State. The miuers who came here iu the early days ueeded ouly very simple appliances to obtain the gold, which the conceutrating forces of nature had gathered in the gulches, ravines, canyons, creeks, river bars and beds, ready to the hand of any who chose to seek for it. The pick, pan, shovel, rocker, long tom and sluice were all the implements which were necessary, for this was the era of "placer" or surface mining, when fortunes were gaiued iu a day. Only rich "diggiugs" would pay to any extent with these appliances, which to-day are mainly used hy the Chinese, in diggings considered by white men as being too poor to work. The sluices only, and these much enlarged, are still nsed hy the whites in their surface work, and the pan is used only for prospecting and cleaning np. None of these things have capacity enough for the preseut system of gold getting in California. For many years, however, our enormous yield of gold was ohtained with these appliances and from these sources. In the year 1855 the snm of $81,294,700 was taken out. Before that it was supposed that gold in quantity was only to be found in ravines, gulches, bars, etc., and as these offered the best rewards they were first sought for. Nothing but labor was reqnired to obtain the gold, aud there was pleuty of nntried territory for all who came. The early miners collected the gold in quantities that now seem almost marvelous. Gradually the area of this surface mining narrowed down, and atteution had to be turned to other sources for the gold which all were iu search of. After a time it was discovered that the great red hills contained plenty of gold in their gravels, though the dirt was much poorer thau the shallow placers. This necessitated the handliug of a great amouut of material, and then it was that hydraulic and drift mining came iuto vogue; then, too, they began to inquire into the sources of the gold, and men commenced to hunt for and open quartz ledges. The collection of gold from these sources is a much more expensive operation than taking it from the shallow aud surface placers, and very different systems have to he adopted.

With the exhaustion of the shallow placers and surface washings came a gradual change of methods. The conditions which prevail in the mining regions of the State to-day are eutirely different from those of the early days of gold mining. The nomadic habits of the miner have disappeared; he is no longer a free lance, roving from camp to camp and living in a tent or cabin while working his claim. Around all the larger miues are permanent settlements, where the miners live with their families, content to work for day's wages and a sure income. The larger mining towns of the State, where there are a number of mines, have lost entirely the old features of mining camp life. The people have settled down to mining as a permanent business, and conduct it like any other industry.

Although the principal large producing gold mines of the State are uow owned by private individuals or corporations, many small claims and "prospects" belong to individual working miners, who do more or less prospecting for themselves, as occasion offers. As a general thiug, however, claims of this latter class are held for sale, the men themselves not having sufficient capital to put them on a producing basis.

California, as the pioneer precious metal producing State of the Pacific coast, and the one which has made the greatest aggregate yield, has very uaturally long since passed its "boom" period, and its mining affairs are conducted on a business rather than a speculative basis. High-priced officials and supernumeraries have been doue away with, and only efficient men employed in the different departments. Railroads and better wagon roads, cheaper supplies, more knowledge and general lessening of cost in operatious, all coutribute to make quartz mining more profitable thau formerly. More care is exercised in conducting operations, and there is a more thorough understanding of the methods of saving gold from its ores. Again, the appliances of mining and milling are more perfect, and there is not so much experimenting as formerly, and mines that would have run a company in debt twenty years ago now yield a profit to their owners. As a result, many old claims, abandoned during a former era, are beiug reopened under the changed conditions of working.

The couuties of Nevada, Trinity, Calaveras, Amador, Placer, Tuolumne and Siskiyou each produce over $1,000,000 a year in gold. Shasta aud Sierra counties each produce over half a million. Butte, El Dorado, Mono, San Diego and Plumas each produce over a quarter of a million. Others which produce over $100,000 per annum are Madera, Kern, Los Angeles and Sacramento. Those which produce less than $100,000 aud over $50,000 are Humboldt and Mariposa. That producing less than $50,000 and over $25,000 is Yuba. Those producing less than $25,000 and more than $10,000 in gold are Tulare, Inyo, Fresno, Lassen and Stanislaus. The counties producing less than $10,000 annually are Del Norte, Merced, Orange, Santa Barbara and San Luis Obispo. The main source of silver supply in the State is iu San Bernardino county, though several of the other counties make a small product annually.

In most of these counties there are still many undeveloped mines awaiting the aid of capital. There is, of course, more or less prospecting carried on in all of them by the residents, and occasionally new claims are found and opened. There is room for prospectors in even the oldest mining counties, but much of the ground has been gone over time and time again. Those who are unfamiliar with the business of quartz mining, but desirous of making investments, will do best when they take the advice of experienced mining engineers before concluding a purchase. The business beiug now au established one, there is nothing in it to tempt a merely speculative immigration, and those who come to this State to enter mining without experience and without capital will he apt to be disappointed. There is plenty of room for the iuvestment of capital, however, and it is not necessary to have a large amount to obtain possession of quartz mines unless they are fully developed and proven to he paying mines. In that case, as in any other business, the mines have a certain market value well known to the owuers and caunot he hought unless the price he paid.

The speculative feature is indeed less prominent in this business than many suppose. Because San Francisco has heeu the seat of extensive mining stock speculation, many imagine that California mines are those dealt in. This is not, however, the case. Very few California mines are listed upon the stock and exchange hoards of San Francisco, The speculation has been mainly in Nevada silver mining stocks, aud California mines have heeu worked for what there is in them, and not for what might be made out of speculations in the stock of the companies in the stock market.

It is to be remembered that in order to ohtaiu gold from quartz mines the quartz must be crushed and the gold amalgamated. The larger mines have their own mills for this purpose, and the smaller ones get ores worked in the custom mills at a fixed rate per ton. But in large operations a mill is required, and this is one of the reasons why capital is necessary in this class of work. Some of the qnartz mines of this State which have been worked for twenty, thirty or more years are still producing. There are hundreds and hundreds of nnproductive and undeveloped claims, or "prospects," all over the State, and which are for sale, because the owners have not the means to open them. It is in this class of mines that there is the most room for investmeut. It is impossible to tell where to look for such claims, but they may be found in every mining county of California.

The auriferous gravels of California still produce a great deal of gold, especially in such counties as Siskiyou, Trinity, Nevada, Placer, Sierra aud Plumas. In Siskiyon and Trinity, where the watershed is into the Klamath river, a non-navigable stream, they may mine by the hydraulic system without danger of interference. In those countics, the streams of which drain into the Sacramento or the San Joaquin river and their tributaries, hydraulic mining may not be carried on except under certain restrictions.

In getting the gold from the deep gravels by the hydraulic method, immense streams of water are turned against the gravel banks through a nozzle aud under great pressure. The stones, gravel, earth, etc., then pass through "sluices," and the gold-saving appliances retain the gold, while the debris passes down into the streams. Immense quantities of low-grade gravel may he made profitable hy this method, as large quantities of material may he handled at a small expense. However, the great mass of dislodged earth, etc., called "debris," or tailings, passing ou down into the streams, shoaled them and injured the farming lands aloug the banks. This in time gave rise to a serious controversy between the miners of the mountains and the farmers of the valley, aud long and costly litigation ensued. It finally resulted in injunctions from the United States courts against the hydraulic miuers, and the mines were closed all through that section of the State drained by the Sacramento aud San Joaquin rivers and their tributaries. For eight or ten years these mines were prohibited from hydraulicking, and in many cases the deposits were then worked by the "drifting" process, which consists of running tunnels and taking out the richer lower strata of the ancient river bed deposits. This is then washed on floors, or, if hard, crushed in "cement mills," which are much the same as the ordinary quartz mills. This is much more costly than hydraulic mining, as only part of the auriferous ground can be worked. In hydraulic mining the whole mass is washed away aud the gold obtained. In drift mining only the bottom part is worked and the rest left. In many places the channels are so covered by lava cappiug that they cannot be hydraulicked, and theu drift mining only is carried on.

In January, 1891, Governor H. H. Markham, in his inaugural address, called the atteution of the Legislature and the people of the State to the practically abandoned sources of gold production iu the hydraulic mines, and to their importance. He suggested the possibility of some amicable adjustmeut of the differences between the valley and the mining counties, and recommended that the subject of rehabilitation of these mines should be thoroughly agitated, Congress memorialized, and our Senators and Congressmeu urged to take all necessary steps to briug the matter before Congress at the earliest possible moment. This official declaration of the Governor of the State gave the hydraulic miners the first hope of relief they had experienced for years. An effort was made among them toward coucerted action, and a Miners' Conventiou called at San Francisco, which was attended by delegates from all the counties. The tone of the proceedings was conservative, the miners asking only that Congress should devise some means hy which they could work their properties without inflicting any of the injuries complained of in the past. In accordance with Governor Markham's suggestion, the Legislature memorialized Congress on the snhject, and the State Miners' Association, formed during the convention, did the same.

A commission of Government engineers, which had previously made an examination and investigation of the region affected hy the hydraulic mining debris, reported to Congress that, under certain conditions, impounding dams for the debris could be constructed, which would prevent most of the damage resulting from this system of miuiug.

Takiug this report as a hasis, the miners of the State urged upou Congress some action which would permit the dams to be built and the miues again worked.

The Caminetti Act was then iutrodnced, and finally, after mauy months of delay and discussion, became a law. Under this, it is now lawful to operate mines hy the hydraulic method in the area drained hy the Sacramento and San Joaquin rivers and their tributaries, providing a license is issued by the California Debris Commissiou, which was created hy this law, and consists of three engineers of the United States Army. In all cases the miners must impound the debris from their mines and prevent it in any way getting into the streams or injuring the lands of other parties. In order uow to obtain a license to mine hy this method and operate the claim, the miners must preseut a petitiou to the Commission, accompanied hy maps of the ground and drawiugs of the proposed impounding works. A hearing is held before the Commission, at which any one objecting to the issnance of the license may appear and show cause. The mining property is personally examiued by the engineers of the Commission, and if the plans are approved and the impounding works properly constructed, a license to mine is issued. At any time, however, if the restraining works are

found to be inadequate to the purpose, the Commission may withdraw the license and close down the mine. In this way the rights of all parties are protected.

Under this new law a few mines in the region referred to, which were previously closed, have resumed operations. A number more have made application for license to mine, and are constructing restraining works, and others are preparing to do so. The effect of this resumption, on the gold product, will not be felt until during the year 1894, as at the end of 1893 very few of the mines had completed their preparations for again working.

Thus far it has been mainly the larger properties, owned by men of means, for which licenses have been asked. In some cases the hydraulic mines are so situated that it is impossible to build the impounding works required. In most of the smaller claims the owners are unable to construct the impounding dams, for lack of means. It is not probable, therefore, that under existing conditions the hydraulic mining industry will attain its former proportions, but it is also true that some hundreds of claims, when properly equipped with restraining works, may again resume operations. In this class of mining, capital is absolutely essential for large operations. Reservoirs, ditches, flumes, etc., must be built, and pipe lines laid, for water supply is a very important adjunct, without which the mine itself is practically useless. It should be borne in mind that this state of affairs relates entirely to the drainage area of the Sacramento and the San Joaquin rivers. In the northern part of the State, in Siskiyou and Trinity counties, where there are extensive gravel deposits, hydraulic mining may be carried on without reference to the California Debris Commission, as the mines eventually dump their debris into the Klamath river, a non-navigable stream.

There is still more or less placer and gravel mining carried on in many of the counties, but it is mainly done by Chinese, who are content with less profit than the whites. No one need count on going into the interior to prosecute this class of mining, for much of the land is already in the possession of others, who, if they do not use it, lease it to Chinese.

On the whole, it may be said that the gold mining industry of California is just now in a prosperous condition, with a probability of an increase of product. Some of the more prominent mines have been increasing their product materially in the past year, and many old claims have been reopened and new ones put in process of development. More attention has been paid to the industry than has been the case in 20 years past, and considerable money is being invested. Not only are Californians themselves showing more interest in gold properties, but men from abroad, and from other mining States and the East, are turning their attention to the California gold fields. There has been more inquiry for gold-producing properties in the past six months than has been the case for many years. In some of the larger gold mining centers many claims have changed hands of late and owners of "prospects" and half-developed claims are much encouraged.

It must not, however, be supposed that gold and silver constitute the only mineral wealth of California, since, while the annual precious metal product is from $12,000,000 to $13,000,000, the total mineral product of the State is nearly $20,000,000 a year. In the census year it was $19,699,354, placing California *seventh in total mineral output* on the list of States, it being exceeded only by Pennsylvania, Michigan, Colorado, Montana, Ohio and New York, whose iron, coal, copper, lead and silver gave them a high standing. In addition to gold and silver, California is a large producer of other mineral substances, some of which are not mined in any other part of the United States.

Quicksilver.—Nowhere else on this continent is quicksilver mined, and our annual product is worth from $1,000,000 to $1,250,000. It comes from the counties of Santa Clara, Lake, Colusa and San Benito.

Borax.—All the borax produced in the United States comes from California and Nevada, but most of it comes from this State. The total product is worth from $800,000 to $1,000,000 a year. In 1893, of the 8,699,000 pounds produced from the two States, 7,499,000 pounds came from California mines. In 1892, of the 12,538,196 pounds produced, 11,050,495 came from this State.

Oils.—Our mineral oils are very valuable, and we stand number six among the States in petroleum product. The value of this in California is from $500,000 to $1,000,000 per annum, and it is mainly from Southern California.

Asphalt.—This State produces more rock asphalt than any other region of the United States. In fact, it is only mined elsewhere in Utah and Kentucky. Our product here comes mainly from Santa Barbara county, and amounts to about 9000 tons a year, and worth at the mines $160,000. The mines in Kern county will shortly be productive also.

Bituminous Rock.—The increase in the use of the bituminous rock has been very great of late years, and there are large deposits in Santa Cruz, San Luis Obispo and Santa Barbara counties. Of this the product is from 25,000 to 40,000 tons a year, and worth from $2.50 to $3.50 per ton at the mines, and $6 per ton in San Francisco.

Coal.—The coal product is quite small as compared to other States, and ranges in value from $200,000 to $300,000 a year. The output has been decreasing since 1889, when it was 121,820 tons, worth at the mines $288,252, or an average of $2.36 per ton. In 1890 the product was 110,711 tons, worth $283,019, or an average of $2.56 per ton. In 1891 the product was 93,301 tons, worth $204,902, or $2.20 per ton. In 1892 the product was 85,178 tons, worth $209,711, or $2.46 per ton. These are the statistics of the United States Geological Survey. Those of last year are not available at this writing. The figures for 1892 show the distribution of sources to have been as follows: Alameda county, 25,618 tons; Contra Costa, 41,440 tons; Fresno, 10,730 tons; Monterey, 560 tons; San Bernardino, 6830 tons.

Magnesite.—No other State mines magnesite, of which our product is from $10,000 to $15,000 a year, mainly from Napa county. It is used in paper manufacture, and for furnace linings. This substance is found in many counties of the State.

Manganese.—In 1888 the State made a product of 1500 tons of manganese, worth $9 per ton, but since then the product has been rather small. The product now averages from 150 to 300 tons a year, and comes mostly from Alameda county, and is worth about $12 per ton in San Francisco. Most of it is used in making chlorine gas, at chlorination works.

Tin.—Though none is being mined here at present, this is the only State that has made any commercial product. The Temescal mine, near South Riverside, produced 162,000 pounds during 1892, but has not since made any yield.

Chrome.—The only chrome produced in the United States is in California, and it is worth from $20,000 to $40,000 a year. It is mined in Alameda, San Luis Obispo, Shasta, Tehama and Glenn counties, but the bulk of the recent product is from the latter county.

Copper.—We produce from 1,000,000 to 3,000,000 pounds of copper annually from the few mines being worked in Calaveras and Nevada counties.

Antimony.—From 1883 to 1888, inclusive, all the antimony mined in the United States came from California; but since that time Nevada mines have yielded more than those in this State. The smelting works in San Francisco make a product worth from $30,000 to $40,000 a year, but California only produced ores worth $2500 in 1893. The mines are in San Benito and Kern counties.

Gypsum.—The deposits in Santa Barbara county were worked for a number of years, and the product when calcined at the works in San Francisco was worth $30,000 a year, the annual product varying little. Most of the output was calcined into plaster of Paris, only ten per cent being sold as land plaster. For the past two years work has ceased on the deposit, the material required for the works here being imported more cheaply from Mexico. Some little work has been done on deposis in Fresno county, but there is little commercial product.

Asbestos.—California is one of the few States in the Union making any commercial output of asbestos, but our product is quite small, being only worth from $2000 to $4000 a year. Up to 1891 no other State made any product of the mineral, but in that year, while this State made a yield of 66 tons, valued at $3960, there was 64 tons from Oregon and 10 tons from Wyoming. In 1892 this State produced 30 tons; in 1893 about 50 tons. It was from Riverside county. The mineral has quite extended occurrence in the various counties of California; but owing to the limited demand, cost of mining and transportation, few of the deposits are utilized.

Building Stone.—We are fast increasing our product in this line. Even now the granite output (which is mostly from Placer county) is worth $1,300,000 a year; sandstone, some $200,000; and marble from $500,000 to $600,000 a year. Our slate all comes from El Dorado county, and is worth about $20,000 per annum, with a prospect of an increase soon.

Platinum.—No platinum is obtained from any other State in the Union, and even the product in California is quite small, amounting in value only from $1000 to $2500 per annum. It is obtained as a by-product from surface gold mining, but very few of the miners make any effort to save it.

Salt.—The salt made in Alameda and San Diego counties is worth from $100,000 to $150,000 a year.

Lead.—The product of lead is small, but it amounts to from 350 to 500 tons per annum, all from Inyo county.

Ocher.—Yellow ocher is mined here, and amounts to from $4000 to $6000 a year; and other mineral paints are also manufactured from local products.

Mineral Waters.—The mineral waters utilized in the State are valued at upward of $25,000 a year.

Natural Gas.—The amount of gas produced is worth from $30,000 to $40,000 a year. Recently a new industry has been inaugurated, namely, the utilization and liquefying of the immense amount of carbonic acid gas produced in the Almaden quicksilver mine.

Clay.—Large quantities of clay, which are used for the manufacture of pottery, fire-brick, sewer pipe, etc., are mined here, the total value ranging into the hundreds of thousands of dollars annually.

Miscellaneous.—The sale of gold quartz for jewelry amounts to from $5000 to $10,000 a year; fancy quartz specimens and miscellaneous minerals for ornaments, about $5000; grindstones, from $2000 to $3000; infusorial earth in the State comes to about $8000 a year.

In nearly all these branches of mineral industry there is room for increase of product as more capital is invested in various mines. In many instances there are known deposits which are at present unworked, owing to lack of proper transportation facilities or cost of shipping to distant market.

The Ivanhoe Tunnel.

The Ivanhoe tunnel, the third longest in America, is cut straight through the backbone of the Rocky Mountains from Busk, a small hamlet fifteen miles west of Leadville, Colo., to Ivanhoe, another little village on the western side of the main range. The tunnel was designed to save the Colorado Midland Railway a steep climb to the summit of Hagerman Pass, and over seven miles wasted in the curves necessary to enable the engines to pull up the heavy grades. The tunnel is 9400 feet long, and is only surpassed in this country by the famous Hoosac tunnel and the Boulder tunnel, in Montana, the latter of which is only 300 feet longer than the Ivanhoe. Where the Ivanhoe enters the mountain at Busk, the altitude is 10,800 feet. This is a much greater altitude than that of St. Gothard, which at Goeschenen enters the ground at a height of 3640 feet above the sea level, and emerges at Airolo, on the Italian side, at a height of 3756 feet. The road over the St. Gothard Pass is twenty-two miles, and the tunnel with its length of 9¼ miles, thus saves 12¾ miles. The Ivanhoe saves much more in proportion, lessening the distance between Busk and Ivanhoe by over seven miles in its length of less than two miles.

The contract for the Ivanhoe, which was let to H F. Keefe, calls for the tunnel to be twenty-one feet high and fifteen feet wide in the clear, and to admit of timbers, ground was broken to the extent of twenty-two feet nine inches by eighteen feet six inches. To accomplish this task, every twenty-four hours 200 pounds of giant powder and 800 feet of fuse were used. For the first 1500 feet that were driven a good deal of trouble was encountered from water and loose rock, in many places the rock not being in place. This, at a depth of 500 to 750 feet, caused a great deal of speculation among mineralogists as to the causes which led to this disturbance. It was generally conceded that the acid in the water had cut many and diverse channels in the soft talc and granite, so separating them from the rock in place that when an opening was made from below, a chute was formed, allowing the whole mass to fall into the tunnel. For weeks at a time Mr. Keefe was kept busy removing the wreckage and catching up the cave, and was retarded in the work by the immense flow of water that usually drained out of one of the "soft spots." The flow of water amounted to one hundred gallons per minute. Wherever the ground is soft it has been substantially timbered with red spruce, squaring 12x12. The ground that is in place is not elely ostimbered. In the work of construction the tunnel was lit by electricity, with an arc light every eighty feet, and several heavy air compressors supplied fresh ozone to the workmen at the heading. Eight air drills were kept steadily going at each approach, and the amount driven per day averaged eight feet. From the center of the tunnel to the surface is a distance of 1200 feet.

The present grade to Hagerman is three per cent, but the grade in the tunnel will only be 1.41 to every hundred feet. This stupendous undertaking was begun in August, 1890. When it is being operated by the Midland, large doors will be put up at the approaches to keep out the snow, and the tunnel for several hundred feet from each end will be heated by steam. Watchmen will be placed at the different ends to open and shut the doors before and after trains entering and leaving. Engines will be coaled up a few miles before entering the tunnel, so that the run through can be made without coaling.

A TRIUMPH IN ENGINEERING is reported from the mountains of Peru, where a twin-screw steamer of 540 tons, 170 feet long and 30 feet wide, has been successfully launched on Lake Titicaca, the highest navigable waters in the world, more than 13,000 feet above the sea. This steamer, which belongs to the Peruvian Government, is to be used for freight and passenger traffic and was built on the Clyde, then taken apart in more than 1000 pieces and shipped to Mollendo by sea. It was then carried to Puno by railway and transported over the mountain on the backs of llamas and mules and put together by a Scotch engineer.

THE composition of English brass is about seventy parts of copper and thirty of zinc. "Prince Rupert's metal" contains 75 to 80 per cent of copper, and on account of its golden color is employed to some extent in jewelry. The kind of brass called "tombac" contains still more copper; nearly 85 parts in a hundred. It is the alloy used for the manufacture of what is called "Dutch metal," an imitation of gold leaf; it can be rolled into sheets, and these can be beaten out till they have only the fifty-third thousandth of an inch in thickness.

Gold-Milling at the North Star Mine, Grass Valley, Cal.

Read at the Virginia Beach Meeting of the American Institute of Mining Engineers, by Emile Rector Abadie, Grass Valley, Cal.

The picturesque little mining town of Grass Valley, nestled in the foothills of the Sierra Nevada mountains, at an altitude of 2500 feet, has been for forty-three years the scene of uninterrupted activity and prosperity, as the center of a mining district which was intimately associated with the pioneer days of California, and the discovery of gold by James W. Marshall, in El Dorado county, in January, 1848.

Although placer mining was inaugurated in Nevada county as early as 1848, the first quartz ledge was not located until the summer of 1850. Discoveries on Gold Hill and Massachusetts Hill increased the excitement in quartz mining, and hastened the erection (during the same year) of the first mill operated in the State.

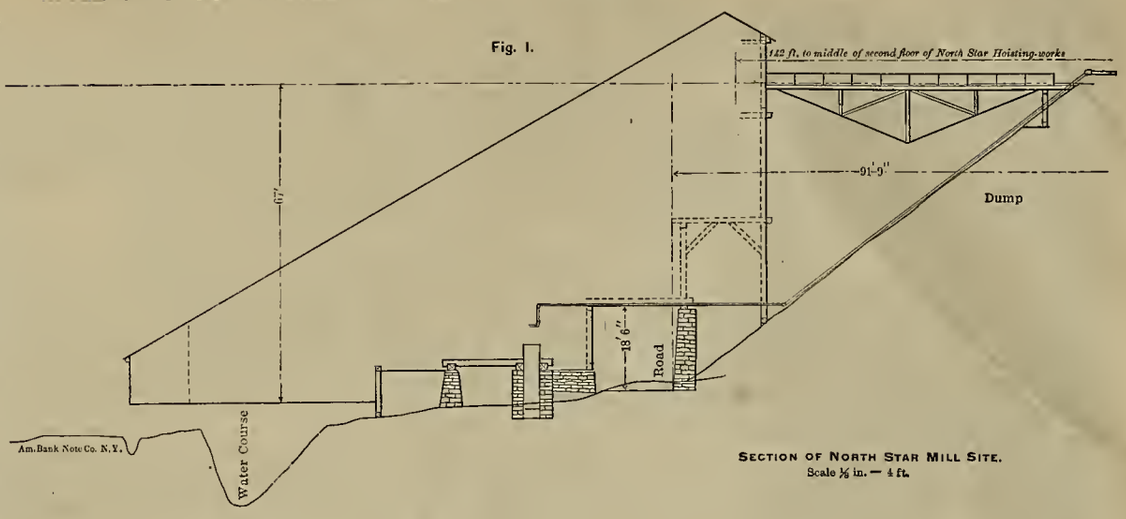
At the close of 1864 the district had produced $23,000,000 in gold, and all the well-known properties of to-day had been discovered and worked. The Eureka-Idaho, the North Star and the Empire mines were in active operation; and to-day we still find them equipped with large crushing plants, operating 80 per cent of all the stamps in the immediate Grass Valley district. Of the mines just named, the North Star possesses the most recently constructed mill, a description of which, the writer believes, may prove of interest to members of the institute engaged in the milling of gold ores.

During the year 1886 operations at the North Star mine (the property of the North Star Mining Coupany) had reached such a stage of development that the necessity of a crushing plant at the mine became imperative, and early in October the erection of a 30-stamp mill was in progress. The building designed to contain forty stamps was speedily erected, and within sixty days the large structure was under cover. The upper cut on page 17 represents the appearance of the mill forty days after work was commenced.

Late in February, 1887, the mill was in readiness, and, upon the completion of the water-power system, then being introduced at both mine and mill, the crushing of ore was commenced March 15, 1887.

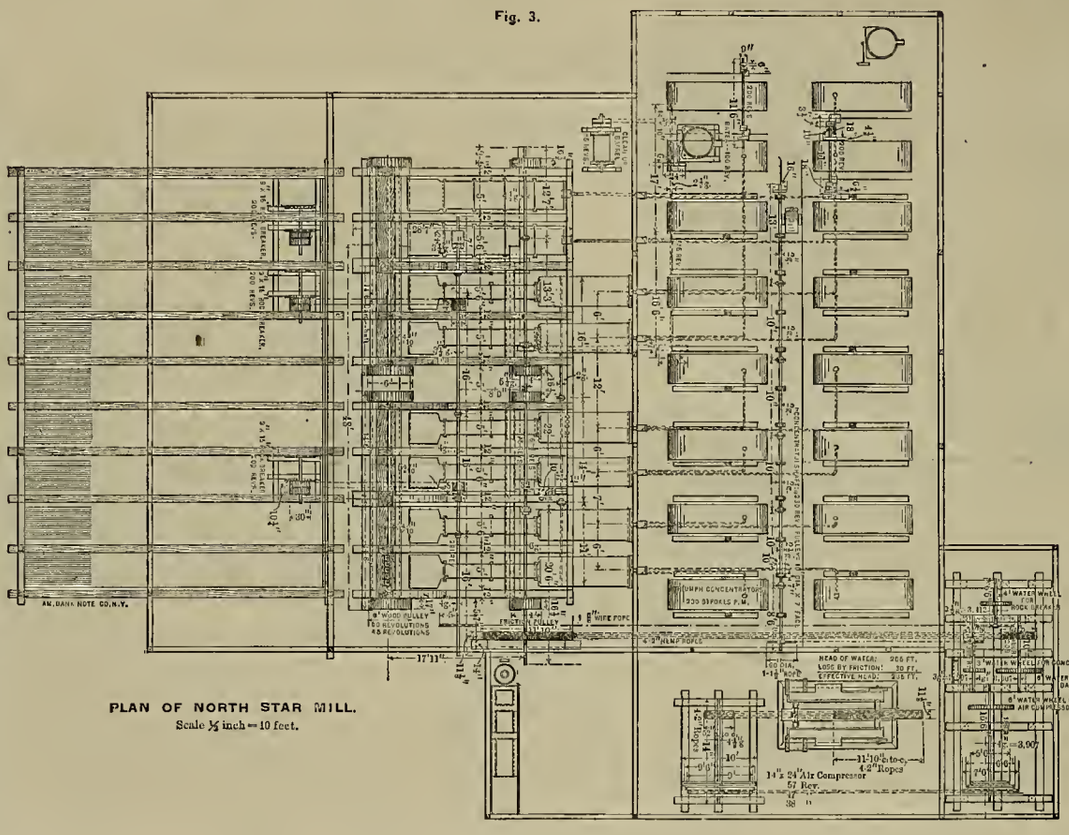
The local topography presented most favorable conditions for a mill-site. At a distance of only 142 feet from the landing floor of the main incline of the mine, it was found possible to discharge the ore at a vertical height of sixty-seven feet above the projected concentrator floor. Fig. 1, showing a cross-section of the mill-site, illustrates the topographical features utilized in locating the present North Star mill. During the construction of the mill all mining operations continued uninterruptedly, the ore extracted being crushed in leased plants one mile distant.

Fig. 1.



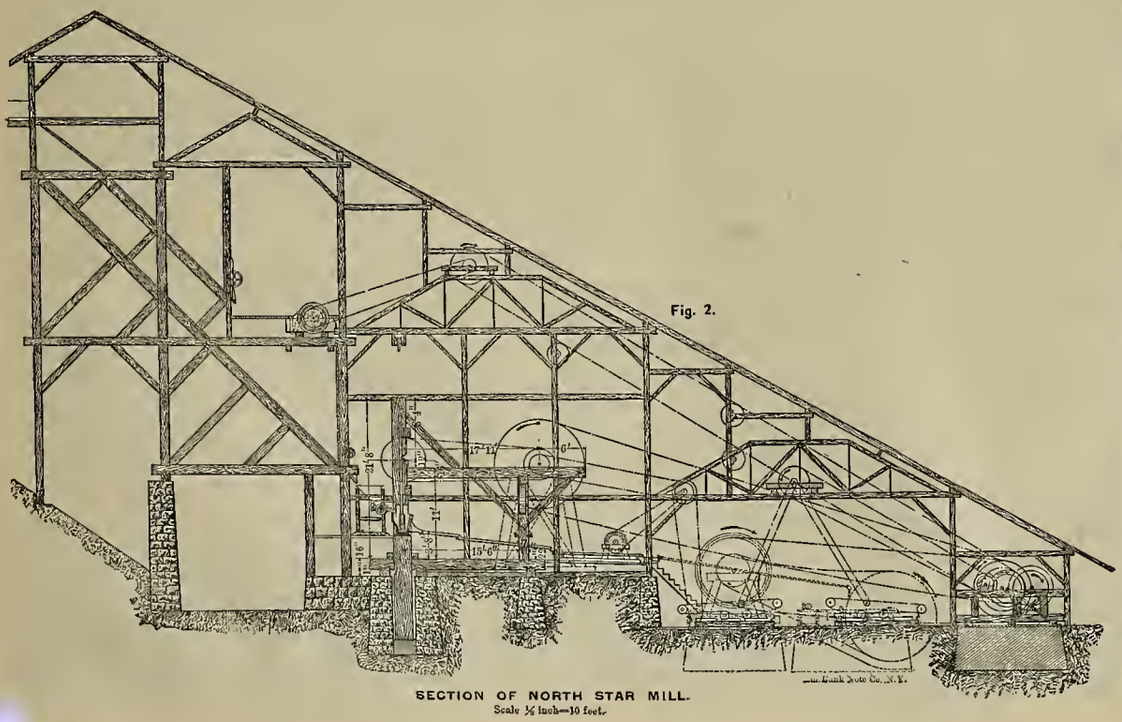
SECTION OF NORTH STAR MILL SITE.
Scale ⅛ in. = 1 ft.

Fig. 3.



PLAN OF NORTH STAR MILL.
Scale ¼ inch = 10 feet.

Fig. 2.



SECTION OF NORTH STAR MILL.
Scale ¼ inch = 10 feet.

From the numerous stopes the ore is trammed to the main shaft, which has now reached a depth of 2400 feet, with an average incline of twenty degrees. The shaft is well equipped with a double track-way, over which 140 cars can be delivered to the surface in nine hours, actual running time. One man on each shaft delivers the quartz to the mill and waste to the dump.

The ore, as raised from the mine, is delivered in mine cars, containing a little over thirteen cubic feet each; three cars making forty cubic feet, or two tons of ore. Sorting on the surface is not resorted to; underground, however, the custom of "stripping" the ledge *in situ* insures for the mill a clean product, generally free from diabase (the enclosing rock).

On passing into the mill the ore is discharged over grizzlies, placed at the top of long ore bins. There are eight fine-ore bins, one for each battery, of five stamps, each provided with a grizzly 4x12 feet in size, set at an angle of forty degrees. The 3x¾-inch bars are placed on edge, two inches apart.

These grizzlies simply classify the mine ore into fine and coarse. The former drops through the grizzly directly into the fine-ore bin, from which it passes through a gate, supplying the automatic feeder, which in turn supplies its own particular battery. Meanwhile, the coarse ore is delivered over the grizzly into the coarse-ore bin, from which it passes through a gate into one of the three rock-breakers. From the breakers it drops as "fine" into the fine-ore bin, mixing with the mine-fine, and passing on into the ore-feeders as above described.

The ore thus passes, by gravity alone, from the dumping-floor to the automatic feeders. One man on the day shift operates the rock-breakers to crush the accumulated coarse ore delivered from the mine. The breakers (improved Blake, 9x15 inches) run intermittently, aggregating not over seven hours' work during the 24.

From the automatic feeders the quartz is delivered into the batteries for stamping and amalgamation. The free-milling character of the material demands only the simplest methods of amalgamation and concentration for the recovery of its gold contents. The pulp discharged through the battery screens flows over silver-plated copper amalgamating plates to concentrating machines beyond, passing thence for further treatment in pans, or escaping from the mill direct as tailings.

This brief outline of the course of the ore through the mill is illustrated by Figs. 2 and 3, which show a section and plan of the mill, and exhibit the very advantageous arrangement of the entire plant.

(Concluded in our next issue.)

The Center of the Strike.

The present great labor strike lends unusual interest to the town of Pullman, Ill., the center of the storm.

On the west shore of Lake Calumet, about fourteen miles south of the Chicago City Hall, is a strip of territory running two miles north and south and about half a mile in its average width. This is the town of Pullman—the Thirty-fourth Ward of the city of Chicago.

The town has a population of over 13,000 and is probably one of the most beautiful of Chicago's suburbs. The land upon which it is located was purchased by Mr. Pullman in 1880 for $800,000. At that time there was one family of four persons living there. The latter part of 1881 the first shops were completed, and February 1, 1882, saw 2084 residents, all living in houses rented them by Pullman, on money paid them as wages by Pullman, with which they purchased the necessities of life from men who rented their stores from Pullman. This condition of affairs has only altered in its increase of magnitude.

The rents for the dwellings are payable precisely as are the wages of the men who are employed by the company—twice a month. Shade trees border both sides of all the streets and are cared for, like all parks, lawns and streets, by the company.

There are nearly eight miles of paved streets that average sixty-six feet in width. The main boulevard and One Hundred and Eleventh street is 100 feet wide. The streets are well drained, provided with catch basins and there are handsome grass plats between the driveway and the sidewalk.

A system of pipes, entirely separate from the drains for surface waters, takes the sewage from the houses and shops to a reservoir holding 30,000 gallons under the water tower. The sewage is then pumped from this reservoir to the Pullman farm, 140 acres, a lot of land situated about three miles south of town. The farm is irrigated with the sewage and it is estimated that 1,800,000 gallons of sewage are pumped there.

The dwellings all suggest a simplified modification of the Queen Anne style of architecture, that is, set off by the round-arched Romanesque appearance of the main buildings and shops.

These latter are devoted to the following industries: The Pullman Palace-car Works, the Union Foundry, the Alley Paper Car-wheel Works, the Chicago Drop Forge and Foundry Company's works, the Pullman Iron and Steel Works, the Calumet Paint Company's Works, the Pullman Brick Works, the Pullman Street-car Works, the works of the Illinois Terra-cotta Lumber Company, the Columbia Screw Works and the Standard Knitting Mills.

All of these concerns have something in common with the building of cars, and each contributes something to every car turned out of the town. There are about six miles of street-car line, and the cars are all of the latest improved pattern in the electric trolley system. There being about a hundred local trains a day for Chicago, there are abundant opportunities for social pleasures.

The wages and earnings in Pullman will average about $2 per day for every person employed. The average number of names on the payrolls at Pullman for one year was 5,455 and the wages paid was $3,331,527 41. The men are all paid by check on the Pullman Loan and Savings Bank and in that bank do they deposit all of their savings. In one year there was deposited $456,853 04, there being 1,903 depositors.

The company's revenue is enormous. The following is a summary of a recent financial statement: Revenue from earnings of cars, $871,145 07; from patents, $19,501 79; from manufacturing, rentals, dividends, interest, etc., $1,881,676 80; making a total of $9,772,324 66. The total disbursements for operating expenses, inclusive of maintenance of interior furnishings for cars, legal expenses, general taxes, insurance, interest on debenture bonds, dividends on capital stock, repairs of cars, was just $6,783,101 18.

This made an excess of revenue over ordinary disbursements, that was carried to the credit account, amounting to $2,989,223 48.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER VII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

Many petroleum springs known to the ancients have been extensively worked in recent times. From those near Baku, on the west coast of the Caspian sea, large quantities are annually exported and consumed by the Russians.

The use of mineral oil as a source of light was well known in Europe in the seventeenth century. The following is from Milton's Paradise Lost, which was written in 1665:

> "The ascending pile
> Stood fixed her stately height; and straight the doors,
> Opening their brazen folds, discover, wide
> Within, her ample spaces o'er the smooth
> And level pavement; from the arched roof,
> Pendent by subtle magic, many a row
> Of starry lamps and blazing cressets, fed
> With naphtha and asphaltus, yielded light
> As from a sky." (Book I, lines 722-730.)

The use of mineral oil in the United States antedates history. The Indians of southern New York and central Pennsylvania were familiar with the petroleum springs of that region, and employed the crude oil medicinally long before the advent of the whites. The early European settlers in America, borrowing the idea from the Indians, gathered this oil and sold it under the name of "Seneca" and "Genessee oil."

The earlier white settlers of the American oil regions, about 1800, noticed "pits," so called, adjacent to the springs of brine and oil. Near Oil Creek, Pennsylvania, there are areas from four to five acres in extent, upon which are clusters of ancient holes from 6 to 12 feet in diameter, very close together, with trees standing in some of them, estimated to be at least 100 years old. The present Indians disclaim any knowledge of their origin.

These did not at first attract special attention; not more than the mounds and remains of earthworks left by the ancients, but as the country advanced in population and wealth, the people had more time, opportunity and inclination to study the subject. At first it was thought that the French, the first white settlers, had sunk these pits, obtained, and in some way consumed, large quantities of oil; but when it was considered that so much labor would not have been expended unless the product was considerable, and that there is no history of oil being shipped to Europe in large quantity from America, this theory was abandoned. Others have suggested the idea that salt and not oil may have been sought.

Many of these wells were found at Hosmer Run, at Pithole (which may have taken its name from this circumstance) and near Titusville and elsewhere, where oil has lately been found in large quantity; in fact, they existed at nearly if not all localities where oil has since been discovered.

Some were oblong, from 4x6 to 6x8 and from 4 to 6 feet deep; some circular, others square. Some were cribbed with round logs stripped of bark and laid horizontally like those in a log house, while in others, logs 12 feet long were set vertically. The local Indians were ignorant of their use; the small quantity of oil required for medicines by them did not require such costly and extensive excavations.

Some historians claim that this country was anciently settled, or at least visited, by explorers from Europe, or possibly by the Phœnecians. Others think China was the fatherland of ancient Americans.

The Phœnecians had used the Syrian asphalt and oil, and were familiar with the Persian Baku locality. It has been shown that the Chinese used oil and gas long before the discovery of America by Columbus, and that the Persian fire worshipers flourished in very ancient times. If either of these people actually discovered this country, it is reasonable to suppose they knew the uses and importance of this oil and perhaps opened these pits.

In 1859 Professor J. S. Newberry, while at Titusville, Pennsylvania, noticed these depressions or pits in the bottom lands on Oil creek, in almost primeval forests, which he was at first at a loss to understand. But at a well sunk in one of them he found it had followed an evidently prehistoric shaft, cribbed with timber like the pits sunk in the copper mines of Lake Superior by ancient miners. The antique ladder was a small tree, the branches of which had been cut off five or six inches from the trunk, forming rude steps. He observed a similarity between this work and that of the oil producers on the banks of the Irrawady and the shores of the Caspian sea, and he was convinced that this was the work of prehistoric races, designated in America as "mound builders."

In early times oil was found floating on the surface of pools on the margin of Oil creek. It was collected by Indians and early settlers by spreading blankets on the surface of the water and wringing them when saturated into suitable vessels. The flat-boat men used to soak rags and tow with mineral oil and make "fire balls," so called, to light the darkness of the night as they floated down the stream on their way to Pittsburg and New Orleans.

From the earliest historical period of the European settlement salt springs were known in Virginia, Ohio, New York, Pennsylvania and elsewhere, first as "deer licks," so called because wild animals, seeking by instinct what their nature required, made trails in the forest leading from every direction to these salt water vents, and the pioneer huntsman, taking advantage of this circumstance, lay in ambush, and so obtained game in plenty. At some of the "big bone licks" in Kentucky, Ohio, and notably in the Mississippi valley, remains of extinct animals, including those of the mammoth and mastodon, are found. These deposits early attracted the attention of scientific men in all parts of the world. The Kanawha river was a noted locality of these salt springs and was at one time the center of the salt industry in the United States. As early as 1829 the product was 1,000,000 bushels annually. At Tarentum, on the Alleghany river, the brine pumped from salt wells contained considerable oil. This floated on the surface in a thin stratum, and could not wholly be kept out of the kettles, to the great annoyance of the salt boilers. After years of experiment, an invention was made which is now called a "seed bag." A bag of cotton, leather or canvas, filled with dry linseed, was slipped down outside the well pipe until it reached the opening through which the oil entered; the seed soon swelling with the moisture, kept back the flow of oil for which there was no use.

(To be continued.)

Wyoming's Soda Lakes.

As described by H. Pemberton Jr. and George P. Tucker, there exists a deposit of sulphate of soda, locally known as a "lake," about fourteen miles southwest of Laramie, Wyo. The deposit is composed of three of these lakes lying within a stone's throw of one another—the Big Lake, the Track Lake and the Red Lake—having together a total area of about sixty-five acres. They are the property of the Union Pacific Railroad Company, and are connected by a branch of that road with the main line at Laramie, and are generally known as the Union Pacific lakes. In these lakes the sulphate of soda occurs in two bodies or layers. The lower part, constituting the great bulk of the deposit, is a mass of crystals of a faint greenish color, mixed with a considerable amount of black, slimy mud. It is known as the "solid soda," and is said to have depth of some thirty or forty feet. Above this solid area occurs the superficial area of pure white crystallized sulphate of soda. This is formed by solution in water of the upper part of the lower body, the crystals being deposited by evaporation or by cooling, or by the two combined. A little rain in the spring and summer furnishes this water, besides which innumerable small, sluggish-flowing springs are present in all the lakes; but on account of the dry air of this region the surface is generally dry, or nearly so, and in midsummer the white clouds of efflorescent sulphate that are whirled up by the ever-blowing winds of Wyoming can be seen for miles. The layer of white sulphate is from three to twelve inches in thickness. When the crystals are removed the part laid bare is soon replenished by a new crop.—Popular Science Monthly.

New Electric Locomotive.

There is an electric locomotive in course of construction in Boston according to the *Transcript*, which promises to meet all the requirements for propelling railroad trains. It is an eight horse-power machine, and it is unique. The distinctive feature of the invention is the substitution of a piston and cylinder in place of the usual rotary motor for the application of power.

The cylinder is much lower than for steam purposes, and has in its interior a series of magnets. The piston passes entirely through the cylinder, with cross-heads at either end. On the piston within the cylinder is a series of armatures of peculiar construction. On the axle of the driving-wheels are commutators, whose function is to apply and cut off the electric current, just as the eccentrics control the steam of a steam-engine. It is practicable to run the machine at 200 revolutions of the axle per minute, and with a driving-wheel eight and one-half feet in diameter and the crankpin three feet from the center there would be a six-foot stroke under a full head of power. The machine is adapted to receive the electric current either by a trolley wire, a third rail in the track or from a storage battery.

Mining Districts of Mariposa County.

The Coulterville district embraces all that portiou of the county lying north of the Merced river, extending from the Merced line to the dense forests and granite domes of the Sierras easterly, and northerly to the Tuolumne line. The district is gridironed with gold-bearing quartz veins. The town of Coulterville is the business center aud only town of note on that side of the river. The territorial extent of this district is more than five times that of "Los Mariposas." The yield in gold from the crude workings in quartz and the primitive methods of placer mining cannot be definitely estimated. It includes several hundred claims recorded under the local laws, and about 25 covered by U. S. patent. The list of patented mines embraces several which have heretofore yielded good returns and are still believed to be valuable if systematically and skillfully worked.

The following are among the prominent mining properties held by the owners under original patent and undisputed title in the district: Penyon Blanco, Tyro, Black Hill, Margaret, Virginia, Louisa, Delia, Midas, Anderson, Mary Harrison, Melvina, Adelaide, Crown Lead, Crystal, Ventura, D. Cook, Melvina No. 2, Red Cloud (or Kate Kearney), Potosi, Louisiana, Banderita, Hasloe, Compromise (formerly Marble Spring) and the Ohlmeyer placer claim.

The Hornitos district includes the town of Hornitos, old Quartzburg, Indian Gulch and a portion of Cathey's valley and all the territory west of the westerly line of the grant and south of the Merced down to the northeasterly boundary of Merced. Within its boundaries are located the Mt. Gaines, Enterprise, Doss, Washington No. 9, Pool group, Indian Gulch gold and silver quartz mine, Jenny Lind, Duncan, Gonzales, Juniper, Jim White, Tandem copper mine and Lorenzo Costa (a placer mine near Hunter's Valley).

The Sherlock district, lying northerly and easterly from the grant, comprises the mines located in the immediate neighborhood of Sherlock's, Whitlock's, Colorado and Sextou's creeks and their tributaries. But a small percentage of the mines in this district are held by patent. The following comprises the list so far as heard from: Whitlock, North Whitlock, Speucer, Feliciana, Sierra Rica, Roma, Colorado, Sierra Rica, Bogan and Battaille; Deltz and the Schroeder, Jones Flat, Goldeu Eagle and Spring Garden placer claims.

The district designated as Sweetwater includes the mines along the headwaters of the creek from which it takes its name as well as Bear creek aud the main and south fork of the Merced. The most prominent mines in this district are the Hite, Cranberry, Rutherford, South Side, Georgia Point, Spring Tunnel, Hite Central and Priest & Coleman. Those are held by U. S. patent. The statistics of the Hite mine show that it has yielded $2,250,000 during 20 years—about two-fifths of the entire product of the Fremont Grant during the same period. To further illustrate the mineral resources of the several districts aud their improved conditions and prospects, a few details are appended.

The Whitlock Mine.—This was one of the earliest quartz locations in the county, dating back to 1853. The first practical work was done in the latter part of the fall of that year by Morris and Goodmau, who built the pioneer quartz mill on Sherlock's creek in 1854. A few years later a new mill was coustructed on Whitlock's creek, just above its junctiou with Sherlock's. The property chauged hauds several times and was subsequently owned by Diltz and Snooks, then by Snooks and Marshall and other parties in interest. It was loosely managed, till it became involved in debt and fell into the hands of Sullivan & Cashman some time in the early sixties. About 30 years elapsed before any further attempt at practical work was made. In 1891 the property was purchased by Capt. A. H. Ward, who is now the owner of this and the Spencer, an adjacent vein. Ward cleaued out and retimbered the old tunnel—a distance of 850 feet from its initial poiut—and then sunk a shaft aud made an upraise to the surface, prospecting as the work progressed, the developments indicating that the mine was better than was at first anticipated. In August last the owner bonded the mine to William Johns, the general agent of the Sierra Buttes Co., who are engaged in several important mining enterprises in other portions of the State, notably the Sierra Buttes in Sierra aud Plumas counties, the Uncle Sam in Shasta aud the Eureka iu Plumas. Mr. Johns is an experienced mining man aud eminently cautious and conservative in the matter of investments. Under his management the cleauing out of the old tunnel was resumed and carried to its terminus, which proved to be 1215 feet from its mouth. It is now being pushed ahead and following the course of the vein, which is from six to seven feet wide aud carries a heavy body of paying ore. The shaft at a point in the tunnel 800 feet from its mouth was sunk by Ward about 70 feet and continued under Johns' management to a depth of 162 feet below the tunnel level, or 362 feet from the surface. At this point drifts were started uorth and south, following the course of the vein, which at the latest accounts showed a width from six to eight feet of good milling ore, which was improving in quality and quantity as the work progressed. Capt. Mills, the superintendent, is an experienced miner. He has a force of 25 men employed and the explorations are being pushed as rapidly as possible. He expresses a favorable opiniou of the miue.

There are several other claims located in the same district which are being opened and developed. The Spencer, Alabama and Farmer's Hope are on the list. The range through which these veius run faces Sherlock's creek on the northeasterly slope. Sherlock's was noted for its extraordinary yield of gold in the days of placer miuing, and from 1849 down to 1856 held the foremost place among the gold producing placers of Mariposa county. The possibilities of future developments in the extensive group of gold-beariug quartz veius in that locality are incalculable.

The latest aud most important development in the Whitlock group was made on the Spencer vein a little over a month ago. In running a tunnel which was commenced last season, a stringer of quartz was struck, which was followed and led to a well-defined lode about three feet in thickness at the point of contact. It carries a strata of ore fully a foot thick, rich in free gold, copper, sulphurets and galena. It differs in character from any ore heretofore discovered in that district. So far as prospected the vein appears to be regular in dip, direction aud thickness, and the ore-beariug strata holds its relative proportion and has improved in quality. The Spencer will soon be on the list of paying mines. It is not included in the property bonded to the Sierra Buttes Company, but is still owned by Capt. Ward and operated under his direction.

The Hornitos District.—One of the best paying quartz mines in Mariposa county at this date is the Enterprise, located in the Hornitos district, on Burns' creek, about a mile from the site of the historic town of Quartzburg. It is now owned and operated by R. W. Barcroft of Hornitos. It was originally known as the Mineral Mountain mine, and was owned by Hassey and Brownfield of Hornitos and Major Harawick of Quartzburg. It yielded very fair returns, and even in the flush times was considered "rich." This was in the first decade of quartz miuing and at that date when "wages" meant from five to eight dollars a day, and when all the appliances for hoisting ore, pumping and blasting were crude and cumbersome and a mine had to be "rich" to cover working expenses and leave a small margin of profit. The water came in and became troublesome. About ten years ago Barcroft organized a small company for prospecting purposes, and thereafter the name was chauged to the Enterprise. They cleaned out the old shaft, which was 70 feet in depth, and on that level ran a drift 80 feet; then they made an upraise of 18 feet and ran a short drift to intersect an old tunuel from another old shaft 54 feet deep. All this work proved to be in good paying ore. In running a drift ou the lower level they struck a heavy body of rich sulphurets and strata of quartz carrying free gold.

Barcroft is an old pioneer miner, with all the tenacity of purpose which characterizes that class of Californians, and laboring under the usual financial embarrassments euvirouing a "49er." Hence the delay in getting things in running order, and it was not until August last that the mills, hoisting works and other appurtenances were completed. He now has in operation an eight-stamp mill with a crushing capacity of 12 tons a day, good hoisting works and a No. 4 Hooker steam pump. To this he has recently added a concentrator of the latest approved pattern.

The ore extracted in the explorations was crushed and the yield was satisfactory—noue of it paying less than $10 per ton and running as high as $20. The owner of the mine had contracted to crush a large amount of ore for outside parties during the winter, which to a certain extent interfered with the develment of the Enterprise, but work has been recently resumed.

The Mt. Gaines mine, another case of suspended animatiou, near the westeru base of the Bear Valley rauge, was reopeued last season with profitable results.

The Hulings property, embracing the Pool group, No. 9 and other mines, has recently been purchased by M. L. Rogers, the owner of the Washington mine. This latter has the deepest shaft and workings of auy mine in the county, having been worked to a depth of 1600 feet.

Another group of mines southerly from the town of Hornitos, including the Doss, Eureka and Quartz Mountaiu, has come to the front duriug the past year. The Eureka is owned by Rogers and the Doss by the heirs of the Brooks estate. This latter was opened a few months ago after several years of rest and is being thoroughly prospected. The vein is well defined and carries an immense body of gold-bearing sulphurets.

Coulterville District Alive.—Evidence of vitality and a renewed and active interest in the quartz mining industry are particularly noticeable in the Coulterville district. The Louisiana—formerly known as the Heslip mine—has been bonded to Messrs. Gove and McKenzie, who have had considerable experience in practical mining and are now pushing ahead in the development of a valuable property which has been lying idle for nearly twenty years.

Practical miners have taken hold of the Banderita and reports are to the effect that a valuable chute of ore has been developed, yielding (as it is stated by those who have the opportunity of personal observation) as high as $40 per ton.

The Pinon Blanco, on the great "Mother Lode," was bonded a few months ago, the real parties in interest being a wealthy English company, though no positive information has beeu given to the general public as to the bedrock facts.

The Tyro mine, about a mile west of the town of Coulterville, is owued by F. C. Jarvis of San Jose. The death of Charles Sutherland, the managing superintendent, and busiuess complications connected with its management, resulted iu a suspensiou of work. Operations will be resumed in the near future. The vein at the depth of 600 feet—the lowest point reached—is fully five feet in thickness, carrying free gold and a fine quality of sulphurets, which were concentrated and shipped for reduction.

Simultaneously with these movemeuts, work has been resumed ou the Bondurant and Red Cloud after a prolonged seasou of inactivity. Superintendent Hopkins of the Red Cloud reports favorably upon the condition and prospects of this mine.

The foregoiug statistics are derived from reliable sources, and although not entirely covering the field of active operations, will serve to illustrate several important facts: First, that the Mariposa grant is insiguificant in area and value compared with the entire county, three-fourths of which is mineral in character. Second, that in the matter of depth the limit of paying ore has not been reached. In illustration, the Princeton shaft, 600 feet; the Hite mine, over 900 feet; and the Washington, about 1600 feet in depth, may be cited as instances. Third, that Mariposa is awakening from a Rip Van Winkle sleep, with a fair prospect ahead for an era of prosperity.

To these, in the matter of statistics, may be added the fact that, outside of the "grant" there are over fifty mining properties held under U. S. patents. The number of unpatented claims recorded and held under the local district laws cannot be readily computed.

The Question of Power.—With a few isolated exceptions, the location of the best mines is convenient for the direct application of water power for mills and other machinery—the Merced river being the only stream of reliable volume. Hence, as a rule, steam power has been necessarily employed. The local supply of fuel has never been very abundant, and with the constant drain upon the scattering groves of timber for domestic firewood, lumber and fencing material, points to an era in the near future when a more economical policy will be forced upon the people. Without discussing the wasteful and reckless methods heretofore in vogue, the impending scarcity of fuel in the foothills is so palpably apparent that he who runs can read the lesson. The item of "wood" has figured largely in the expense accouut of mining euterprises, and may be set down as au important factor in the wasteful methods which have culminated in suspension, abandonmeut and financial wreckage.

As an example, take the Washington mine, where for several years the cost of wood for running the mill, hoisting and pumping machinery, and incidental appurtenances averaged over $75 per day. This serves the purpose of an object lesson and fairly illustrates one of the disadvantages under which the quartz-mining industry has labored.

The recent achievement in the application of electricity as a motor, when harnessed to an unlimited water power as the generative agent, points to a practical solution of the problem. The Merced river, from the floor of the Yosemite valley down to the western boundary line of the county, has a fall of about 3700 feet. The stream is perpetual—a surging torrent during the severe winter rains and in the early spriug months, and eveu at its lowest stages carryiug water enough to furuish power sufficient to run the quartz mills and other machinery for all the mines in the county, and au electric railroad through the foothills to the Yosemite valley, the Big Tree grove, or any altitude where wagon roads have heretofore been constructed. The distances from convenient points on the river for the necessary water supply and the mines where the electric power can be utilized will range from five to fifteeu miles. The limit of distance for the transmission of power by wire has not yet been reached, but practical experiments have demonstrated that for any of the short-range requirements in counection with the mining operations herein noted, the subtle agent can be transmitted without auy appreciable loss.

These facts have not escaped the attention of the mine-owners, and several parties interested in the development of the miueral and other resources of the couuty have been moving in the direction of organizing a company with the object of utilizing the wasted forces of this magnificent stream for the purposes herein mentioned. Estimates are given of cost of construction of dams and all the appliances, together with an electric road, haviug its termiuus at a point couvenient to Yosemite valley, and an outline statement in detail of the profits which will naturally result from the enterprise. These details have been embodied in a prospectus which, when rearranged and more fully elaborated in some impor-

tant particulars, will be given to the public. The enterprise has been made the subject of deliberation and discussion for several years by men who fully comprehend the situation and have the courage of their convictions but, unfortunately, lack the sinews of war for carrying on the work to a successful issue. Capital just now is held in a tenacious grip—the consequeuce of investments in inflated securities; hence the nervous condition of the money market. With the recovery of a healthy tone in finance, no enterprise promising such grand results will go begging. Mariposa's mineral resources are second to those of no county in the State, and practically are only in the first stages of development. The utilization of the Merced river and its application to the electric dynamo solves the problem of cheap power. It is the key that unlocks the golden gate of financial prosperity in Mariposa county.

Scientific Progress.

Direct Treatment of Pulp by Cyanide.

A modified method for securing direct treatment of the pulp leaving the battery, says the Australian *Mining Standard*, is to be tried in connection with the cyanide process by the Robinson Company at Witwatersrand. Where pulp has been run direct into cyanide vats, two difficulties have been generally eneountered, one being due to the packing of the sands as a consequence of currents in the solutions from which they are mechanically deposited, and the other to a segregation of the "slimes," or finer particles of the pulp, giving rise to imperfect filtration and extraction. These difficulties have, to a certain extent, been overcome by the use of hydraulic separators at some of the mines, but the principle of the method which will now be tried at the Robinson Company is to allow the pulp to settle through solutions which, below their surfaces, are in a state of rest, it being fouud that, by this means, successive portions of the sands carry down with them a certain proportion of the slimes; that an intimate mixture, without segregation, is thereby brought about, and that, in eonsequence, the resulting product is easily susceptible of cyanide treatment.

With this object, the pulp leaving the battery is run direct into intermediate vats fitted with hottom discharges in which the mixing is effected, prior to the tailings being carried to the cyanide vats proper for treatment. It is asserted that the extra eost due to the necessity for a single handling is extremely small, aud that the slight economie disadvantage thereby oecasioned is amply counterbalanced by the increased percentage of extraction that can be seeured, as a consequence of the tailings having bcen brought into the eoudition most suitable for chemical treatment, the mixing of the "slimes" and sand effected in the vats being naturally assisted by the discharge and redelivery from trueks. To ensure a distribution of the pulp in a uniform manner without violence over the whole surfaee of the intermediate vats, an arrangement resembling in principle a garden sprinkler will be made use of. The eost of the extra vats required for this intermediate settling proeess will not be large, as the moment a vat is full it eau be at onee discharged.

A Paper Fire Engine.

The Fire Department of Berlin has a fire engine, the earriage of which is construeted entirely out of papier mache. All the different parts, the body, wheels, pole, etc., are finished in the best possible manner, While the durability and powers of resistanee possessed by this material are fully as great as those of wood, the weight is, of course, much less. The lightness of a fire engine is, of course, a great advantage, and it seems not unlikely that wooden carriages will in a short time pass out of use altogether.

Light on Logarithms.

An expert engineer in a New England city rendered a bill to a eorporation who had employed him to write a technical report. The amount of the fee was large, the corporation refused to pay it, and the claim was carried into court.

During the trial the counsel for the corporation sought to belittle the expert's work, raising questions as to his experience, and, in fact, to prove that his labor would have been amply rewarded with a few dollars a day.

"How did you reach this result?" asked the lawyer, referring to a certain calculation which had involved the use of logarithms.

"I consulted Napier's table and"—but he got no further.

"You consulted Napier's table, did you?"

"Yes."

"Do you mean to tell this court that you, an expert, had to resort to a publisbed table? Did you prove the figures of that table?"

"No, but they have been proved. They are considered to be aecurate by every scientific man."

"Why do you not work out your own table of logarithms? Is it not because you are unable to do so?"

"It is not. I am perfectly capable of preparing such a table: but it would have taken too long a time to do so, and so I consulted the standards."

"In order to prove your calculations as well as your capabilities in this matter," continued the suspieious lawyer, I will now ask you to prepare a table of logarithms."

"Here and now?" inquired the plaintiff. "I fear it will eonsume too mueh of the court's time."

This seemed to confirm the lawyer's doubts, and so he insisted the more upon having a eomplete table of logarithms prepared.

The plaintiff smiled maliciously, took paper and pencil and began his work. In about five minutes the lawyer asked him if he had finished. The plaintiff shook his head and continued at work. Ten minutes passed by and again the question was put:

"How nearly finished are you?"

"Very far from finished," remarked the plaintiff.

"Well, may I ask how long it will take you to prepare a table such as Napier's? You seem to be very slow about it."

The expert hesitated a little and then repbed: „"I estimate that, working alone, I might be able to complete it in about 15 years, working day and uight. It took Napier and five assistants seven years to prepare his table, but I am less familiar with the ealeulation than he was, and, as you say, work slow. Still, in 15 years I think I eau complete it."

It is unneeessary to say that the lawyer was not a little taken aback by the answer, which enlightened him a trifle on the subject. He withdrew the questions, and eventually the expert wou his ease.

Photography—Astronomy.

In a leeture recently debvered by Edward Barnard in this eity, he said that the introduction of photography into astronomy has gradually effeeted quite a revolution, and necessitated modifications in great teleseopes. Photography takes what the eye cannot do, for it is cumulative. It stores up the effect of bght aetion during minutes or hours, consequently reveals facts which eould not be ascertained by human vision. With eye observatious, if the driving clock falls a little out of time, and a star passes off the mierometer wire, the observer can shift the telescope a little and bring it back again. With photography this is not possible. Moreover, a slight shifting of the instrument will give an elongated image of large stars and a double image of small ones. The teleseope, therefore, must be driven aeeurately, no deviation of more than one-twentieth of a second being permissible.

The driving mechanism, therefore, has to be of the highest quality; any deviations of the elock have to be forthwith correeted by means of another timekeeper, and the telescope at once brought back to its true position. This extra timekeeper is a pendulum beating seconds, and driven by electrical pulsations. At each beat it sends local electrical pulsations through a portion of the mechanism of the clock, while exercising its functions. Every portion of the whole instrument must be made to give its aid; the telescope must be rigid, firm, and the axis of every part fairly accurate. The current from the governing pendulum can return from the clock by either of three routes, all of which come into circuit one after the other; and when everything is right, it gets back by the central contact. This part of the apparatus is called the detector, because it detects any error. If the current gets back through either of the others, the error is corrected by means of a relay, electro-magnets and differential gearing. He rang two bells by means of the pendulum, each bell sounding seconds synchrouously; then he threw one of the bells greatly out of time. The governing apparatus then corrected the error step by step, until in a few seconds the bells were again beating synchronously. By this system, he said, it is impossible to introduce a time error without its being corrected.

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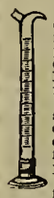

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Two More European Cables.

Two more cables are being laid across the Atlautic. There are at present ten cables connecting the Old with the New World, but so rapidly has the cable business grown that they are inadequate to handle it all. It was on August 16, 1858, that the first message was sent under the Atlantic, but the cable broke down 23 days afterward aud communicatiou was uot resumed until July, 1866, since which time it has been uninterrupted.

The original charge for a message, while there was only one cable in existence, was $5 per word, but the laying of uew cables, with consequent competitiou, has brought the price down to 25 cents per word, and, as a result, the business has enormously increased. Now one of the cable companies is adding to its equipment by putting down two new cables, the shore ends of which are now beiug laid. No cables had been laid during the previous ten years, but experiment in the meanwhile has shown many improvements, and these have been incorporated in the new lines.

The cables have beeu made by Siemens Bros. & Co., whose factory at Woolwich, England has been working night and day to complete the order, so that the cable may be laid during the early spring. Altogether 2201 uautical miles of cable have been made, and these consumed 495 tous of copper wire, 315 tons of gutta-percha, 575 tons of jute yarn, 3000 tons of steel wire and 1075 tous of compound aud tar, making a total weight of 5460 tons. The order for the cable was given November 21st of last year, aud rapid work was begun at once.

The cable is largely made by machinery, and the twistiug of the wire and covering with tar and gutta-percha are done by automatic apparatus. The deep-sea portion of the cable, which is the smallest part of it iu size but the longest in length, was mauufactured at the rate of five uautical miles per day by one machiue, and there being teu machines of this kind at work, there were 55 miles of deep-sea cable turued out every 24 hours. The shore ends of the cable, however, required much more time to manufacture. It is necessary that these should be very large and strong. As long as the cable lies along the bed of the oceau it is out of harm's way. No storms, however violent, can reach it. It is uot affected by any change of the temperature, and it is too deep to be molested by fish or any kind of marine creature.

It is therefore only necessary that the copper wires of the "core," which conveys the message, be thoroughly insulated and kept dry. This is accomplished by their being covered with a coating of jute and gutta-percha, over which is a sheathing of small steel wires. This sheathing increases in strength and protective power as the shallow water is approached, aud there are seven different sizes in the new cables. This "core," containing the copper wires along which the messages are sent, is carried through all sizes unchanged. The heaviest part of the cable is that which is near the shore, where the motion of the waves may wash it to and fro among the rocks and stoues, that would otherwise soon cut it. Along the banks of Newfoundland fishing schooners auchor and occasionally pick up the cable, and that contingency has to be provided for in weight and strength.

From the time the cable is fiuished until it is paid out over the stern of the cable-laying steamer Faraday, it is never allowed to get dry. It is kept in large tanks of water and transferred to such tanks aboard the Faraday, where it is coiled up. The Faraday, coming back some six weeks or a month later, will look around for the buoy in order to pick up the cable again.

Thus, passeugers across the Atlantic this summer may see a buoy away out in the ocean, but mariners will be warned to let it alone, as it marks the end of one of the sections of the new cable. The Faraday can lay the deep-sea portion of the cable at the rate of seven nautical miles per hour, proceeding under almost a full head of steam. The cable is simply paid out from the stern like a rope. Occasionally, however, the steamer will stop and pay out a lot of cable before proceeding. This is done where she comes to a cliff or sudden fall iu the bottom of the ocean, which is not level, as some people imagine, but has all the topographical features of dry land.

The Faraday is provided with maps of the bottom of the ocean as accurate as if made by submarine surveyors. At all points it is sought to have the cable actually restiug on the bottom and not stretching from hill to hill. While the Faraday is layiug the cable the electricians on board are constautly keeping up communication with the shore, so as to see that it is in good running order, and while in the middle of the Atlantic the officers of the ship may learn the latest news. When a buoy is picked up the submerged end of the cable is slowly hauled aboard and carefully spliced to the other section. It is estimated that the Faraday will lay the deep-sea section of the cable in about ten days.

Dowe's Cuirass.

Much interest has been manifested both in England and America regarding the new bullet-proof cuirass, consequeutly the following from our special commissioner regarding some experiments that were recently made in England will not be uninteresting to many:

Hiram S. Maxim has been so much disturbed at the fuss made about Herr Dowe's cuirass that he devoted au afternoon to making a similar one, and invited all aud sundry to see it tested at the Firth Gun Works iu Kent. Among those who attended, on June 1st, were Captain Dutton Hunt, Goverument Inspector of Musketry, and C. F. Lowe, a Queen's prizeman, both of whom had taken an active part in testing the Dowe cuirass, which weighs 12 pounds, and for which £200,000 sterling (practically a million dollars) is asked.

The Maxim cuirass is three pounds less in weight, and the price asked for the secret of its manufacture was the modest sum of seven shillings and sixpence, and the manager of the Aquarium has actually been supplied with one at this price.

For the purposes of the test on Junc 1st, a steel plate was placed iu line with the cuirass, and the bullets pierced the steel plate, making a hole as clean as if it had been done by a drill. The firing was done chiefly by Royal Marines, armed with the Lee-Metford rifle, black powder and cordite charges being used alternately. The German service rifle was also used with cordite charges, to show the greater penetrative power, which was, however, only shown on the cuirass by dents deeper thau those made with the Lee-Metford.

At the eud of the experimeuts, which were highly satisfactory, Mr. Maxim dissected his cuirass and showed that it contained a steel or iron plate about three-sixteenths of an inch thick, with a second and thin plate of nickel and some carbou between them, which is said to supply the necessary resistance. Mr. Maxim's exposition of his great "secret" was greeted with laughter and cheers.

The Manard team of sharpshooters met with disaster at the Canterbury Music Hall, London, England, on May 26th. The last shot of the entertainment was fired by Professor Manard at the lady wearing the bullet-proof coat, whose stage name is Miss Julie Manard. Through some carelessness on the part of the shooter the bullet lodged in the lady's neck. Fortunately it did not hurt her much, but this has seriously discounted the whole show, for it seems clear that the impetus of the bullet must have beeu very slight, which would imply that the bullet-proof coat has very little to resist.

Herr Dowe's cuirass has been exhibited publicly at the Royal Aquarium daily since May 28th, and the tests are quite as severe and as bona fide as those applied to the Maxim cuirass, but its weight is considered prohibitive, as it only protects a part of the chest, and the pad in which the protective shield is inclosed is so large as to interfere seriously with the movement of the arms of the wearer.

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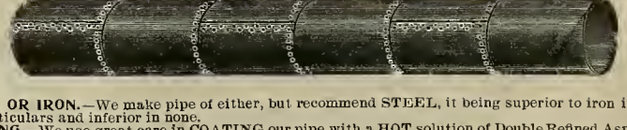

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

AN ENCOURAGING OUTLOOK.—*Chronicle:* The mining outlook for Calaveras county is very promising at present for a genuine mining boom. At Angels Camp they already have it, while at San Andreas and intervening country to the north boundary of the county, including Mokelumne Hill, West Point, Railroad Flat, Glencoe and El Dorado, there are signs of new life. Old mines that have been idle for years are being pumped out, prospects and new locations are attracting unusual attention, while hydraulic and drift mines are also being looked after by outside capitalists.

Kern.

J. W. Davis and R. M. Maddux have bought the Woody mine. This mine has been developed about a quarter of a mile in length, and in some places more than 100 feet in depth, the lead being well defined, varying from one to two feet in width. Some of the ore was recently worked by the slow process of a horse arrastra, and it was found to run from $20 to $60 per ton. It is the intention of Davis and Maddux to put up a Huntington mill on White river, three miles from the mine at the mouth of Grizzle gulch. A ditch one-half mile in length will carry the water of White river to the mill site, where a large overflow wheel will be used. The water in the river is sufficient to run a large mill more than one-half of the year. There is a large body of ore, perhaps 1000 tons, in sight, which can be easily extracted, and hauling will be cheap. It cost but little to complete the road to the site, and the grade will be a continuous descent from the mine to the mill. Both men are practical mechanics and miners, and they estimate that the ore can be worked at $5 per ton, or perhaps less, as the ore is free milling.

Plumas.

SUCCESSFUL WORKING. *National-Bulletin:* That hydraulic mining can be carried on in Plumas county without any material injury to the navigable streams or to adjoining lands, there has never been any serious doubt in the minds of practical mining men acquainted with the topography of the country and its location fully a hundred miles from navigable points. The operations of the Quincy Mining and Water Co. at Spanish Ranch, under the direction of the California Debris Commission, have conclusively proven the soundness of these views. Acting under instructions of the commission, the company built a series of restraining dams in Wapaunse creek, thus forming settling reservoirs, not only for the restraint of sand and gravel, but of still finer material. The restraining works are the most extensive and important erected by order of the commission. They are substantial and fully adequate for the purposes intended.

On Monday we visited the scene of operations; found the mine using two large monitors in washing down the bank of dirt and gravel, which is carried through a cut and sluice boxes and dumped into a storage basin above the upper dam, which basin is about a third of a mile long and widens out at the upper end, thus forming a basin valley-like in appearance, and of great storage capacity. The gravel and sand are deposited and spread out near the end of the sluice, while the finer material is carried into a lake formed in the upper part of the basin, and there permitted to settle. The water flowing from this lake carries no sand whatever, and only a very small amount of fine, flour-like, impalpable material held in suspension, even if it were to stop in navigable streams. But this it will not do; the extremely fine coloring material will flow unchecked to the sea. The amount of this matter escaping from the restraining works has been reduced to the minimum. At Spanish creek bridge, on the Indian valley road, 15 miles below the mine, hydrometric tests made in our presence, showed that the water carried only a bare trace of the so-called "slickens"—the merest fraction of one per cent. The same was true at the "Pocket" and at the bridge at the Mill's office in this valley. At the "Pocket" there was no evidence of debris piling up. Not long since, an expert examination was made of the bars in Spanish creek in American valley, and it was found there was no appreciable amount of deposit of silt resulting from mining by the hydraulic process.

The above facts show that debris can be restrained and that hydraulic mining can be successfully prosecuted in Plumas county, as has been and is now being done by the Quincy Mining and Water Company. This can be accomplished in numerous other places in the county. For the benefit of our own people and the prosperity of the State, we hope that it will be done. These mining enterprises employ labor, consume large quantities of supplies, extract and put into circulation lots of money, and thus contribute to the prosperity, progress and happiness of the whole people.

The Quincy Mining and Water Company is having surveys made by Mr. Keddie to increase the water storage and to bring in another ditch, so as to lengthen the water season. We understand that the company is well pleased with the cleanups made thus far, and that it has been discovered that it will be very profitable to save the large quantities of black sand in the gravel, for it assays $433 per ton in gold.

San Diego.

SOME LARGE STATEMENTS.—"Of the great mining enterprises in eastern San Diego county," says H. Harrison, "the average San Diego man is entirely ignorant. He may have heard of Cargo Muchacho, Picacho and Gold Rock, but his information ends there. He does not know that perhaps the most promising gold region in the United States begins in San Diego county and continues in Arizona in the region of Gila City. Old prospectors went over the country for years, and were satisfied that millions existed in the great ledges cropping out along the western banks of the Colorado, but the complete isolation of the country deterred capitalists from opening the prospects. Hardly over a year ago two green young men from Sioux City, Ia., named Hedges, took hold of the Gold Rock mines. Within the past month, to my personal knowledge, they have refused an offer of $2,000,000 for the property. There is a man here in San Diego who happens to know that they were offered $1,500,000 some months ago, which they refused.

"The Gold Rock mines are situated five miles north of Oglesby station on the Southern Pacific. They are fourteen miles from the river. In the past year Hedges, Fuller & Co., the owners, have put up a forty-stamp mill and a complete pumping plant, bringing water from the Colorado. They are about to put up an additional forty stamps. Fifty men are employed, and eight miners keep the forty stamps going. There are thousands of tons of ore already mined. The ore runs on an average of $10 per ton, and the owners are clearing $30,000 per month, with forty stamps. The cost of milling there is only $1.80 per ton.

"The size of the vein? Well, you would have to measure the mountain to find that out. You could turn a six-mule team in the mine as it stands now, and the development has just begun, comparatively. The owners have other property just as big in the same district, of which nothing more than mill tests have been made. The amount of mineral in sight is tremendous. Denver men, Chicago men, Kansas City men and San Francisco men have been attracted to the mines, but the owners steadfastly refuse to sell. Prospecting is being done at a lively rate, and since arriving in San Diego I have received word of discoveries in the district and around Pilot Knob, south of the railroad. The country rock is granite and limestone. All ore I ever saw in that country is free milling.

"The Cargo Muchacho mines are running again, and they are yielding the owners, Blaisdell & Co. of Yuma, a bonanza. About forty men are employed there. The mines are situated ten miles from the river, between the river and Gold Rock. Water is piped from the river. The mill has thirty stamps, and has plenty of ore to work. The cost of milling is the same as at Gold Rock—$1.80 a ton. There is plenty of wood in that section, consisting mostly of ironwood and mesquite. The ironwood is as heavy as mahogany, and costs, delivered at the mill, $4 per cord.

"Another great mining enterprise in San Diego county is the Picacho placer diggings. They are eighteen miles north of Yuma, on the river. They are about 800 or 900 acres in extent, and the dirt is worth forty cents a cubic yard. The plant is owned by Englishmen, the managers being Clayton and Alley Smith, Englishmen, who know nothing whatever of mining. They depend upon their superintendent, Col. Moreland, an American, who is as ignorant as they are. About $300,000 has been spent there, and mining men who have visited the diggings say the work has been botched and the money mostly thrown away, though experienced men could take hold of the proposition yet and rearrange the plant and make it pay big. Col. Moreland, like others who know nothing of mining, is a lucky fellow, and he has found a mine on the Gila river for which he has been offered $150,000."

Tuolumne.

MINING NOTES.—*Independent:* There is considerable activity in the mines at Quartz Mountain and vicinity. At the Dutch they are keeping the water out of their 210-foot shaft, awaiting the arrival of heavier hoisting machinery. This shaft shows a five-foot vein of excellent mining rock in the bottom, with more pay ore on the foot-wall side, the width of which has not been ascertained. Work of sinking will be resumed when the new hoist is in place.

The App mine is being worked steadily. They are drifting with Burleighs on their 800-foot level, to intercept the fine body of ore encountered on their 700-foot level.

The Miller and Holmes mine is rapidly improving as depth is attained. Their double-compartment shaft, which is now down 200 feet, is well constructed. The ore found is of payable quality.

The mill on the Golden Rule was started on the 27th ult. This mine is now the property of Messrs. McGinn and Cressy, and promises soon to resume its former record as a dividend payer.

The New Era, containing the same character of ore as the Golden Rule—which mine it adjoins on the south—presents an excellent opportunity for mining investors. The same vein that makes the Golden Rule mine, being the eastern slate series of the mother lode, occurs here through the entire length of this property, and carries gold in paying qualities wherever sunk on. The deepest shaft is 80 feet.

The Jumper, adjoining the New Era on the south, being the property of Mr. Fisher, is still idle. This mine contains a fine shoot of rock near its northern boundary. There is a dump of 100 tons of rock extracted from their shaft, which will mill $20 per ton.

Further south, on the mother lode, is the Mammoth mine, near Jacksonville. This mine is now being operated by Messrs. Stent, Witney and McDougall. The development work now being carried out surpasses the most sanguine expectations of the fortunate prospectors. The north drift has been advanced 164 feet. This vein shows a width of from 10 to 25 feet of rock, showing by tests $6 to $20 per ton in free gold. The property is being opened by tunnel. It is the intention of the present mine-owners to run in a tunnel near the level of Woods creek, where they can obtain 900 feet of backs. The shoot on this property is 1200 feet in length. A stamp mill will be erected immediately, as there is already enough ore in sight to keep 20 stamps running for as many years.

The Dead Horse mine, near Summersville, made a lucky strike when the 1300-foot level was reopened. The vein now encountered averages over four feet, and shows free gold in abundance.

The Parole mine, near Confidence, has been taking a few days' rest, awaiting the arrival of a large pump from San Francisco, which is expected soon.

The Belleview mine has struck very rich ore northeast of main shaft. The rock carries a very heavy percentage of sulphurets, iron pyrites and galena.

The Rappahannock is busily engaged in getting their machinery on the ground, to be placed at the south shaft. A large storehouse is completed and the superintendent's dwelling is being erected. The whole property is being fenced in with posts and wire. The development of center shaft is still in ore body. Cross-cutting is being continued.

NEVADA.

Washoe District.

The weekly official reports of the Comstock superintendents are thus summarized:

On the west side of the upraise on 1650 level of Con. Cal. Virginia, between south drifts 2 and 3, in the ore body recently found, are stoping out, and the ore in this direction is still looking well. Have been timbering and putting an ore chute in the upraise between south drift 4 on the 1700 level and south drift 3, which is 22 feet above. From these places we have extracted during the week 237 carloads of ore, about 235 tons, the average assay value of which per mine car samples was $67.57 per ton. No work has been done in the south opening on the 1700 level.

Have shipped during the week to the Morgan mill 552 tons 1070 pounds of ore, the average assay value of which per railroad car samples was $65.62. The average assay value per battery samples of all the ore worked at that mill during the week, 570 tons, was $58.92 per ton. Bullion now on hand in our assay office, assay value about $9600; bullion shipped to Carson Mint, assay value $37,588.67. Have been making repairs at the Con. Virginia shaft station on the 1520 level preparatory to the conducting of the water which was recently tapped in the west drift of the West Con. Virginia and California down to our 1650 level.

The west crosscut started from the main drift, 345 feet south from the shaft station on the 1000 level, has been extended 25 feet; total length, 60 feet; face in porphyry and quartz formation carrying a low assay value. At a point 280 feet south from the shaft station on the east side of the main drift we have cut out an opening and commenced sinking therefrom a two-compartment winze. Have been making the usual necessary repairs in the main drift.

The west crosscut on 1465 level of Ophir is stoped in harder porphyry, carrying clay separations. From north drift an east crosscut has been advanced 10 feet in vein porphyry formation. The north drift from west crosscut continues in old fillings, assaying from $3 to $8 per ton. From end of west crosscut a south drift has been advanced in quartz and old fillings, assaying from $5 to $15 per ton.

The Union Con. and Sierra Nevada joint north drift on 900 level has been extended 5 feet in hard porphyry. The joint south lateral drift is in clay and porphyry. Repairs prevented a greater extension of first-named drift. The west crosscut 1465 level of Mexican is in porphyry, clay and quartz. The workings of Best & Belcher on 200 and 800 levels are in soft porphyry and quartz.

The workings on 900 and 1100 levels of Hale & Norcross are in clay and porphyry.

IDAHO.

WORK ON PLACERS.—Wardner *News:* A number of the owners of placer mines in and around Murray are engaged in cleaning up, and from appearances and talk will show a fair average. The Spokane Hydraulic Company's water will be utilized on the Simmon's ground on Dry gulch as soon as the pipe can be run up, which will be in about a week.

OREGON.

WILLIAMS CREEK MINES.—*Courier:* There is considerable stir in the Williams creek ledges. The Bone of Contention has 20 men at work, some running a 1200-foot tunnel, some stoping, and others sinking an air shaft on top of the hill. They have struck five feet of good ore in this shaft, which is now down 50 feet.

The Ezzell mill started up Tuesday, running eight stamps. A large overshot wheel has just been put in position and it furnishes four or five-horse power night and day.

Anderson & Holyoke will start their mill this week. They got their power from the Gotcher ditch and will run night and day.

There will be about 100 men employed at the mines and mills on the Williams creek hill this summer.

IN SOUTHERN OREGON.—E. P. Thompson of Grant's Pass, in speaking of southern Oregon mines, says: "There is a great deal of activity in mining circles just now, and many properties that have been inaccessible during the winter, because of the depth of the snow, are being cleaned up for the summer run. Prospectors are just as numerous as in former years, and no complaints are heard of the country being prospected out. A large amount of development work is being done, and with very satisfactory results. The Bone-of-Contention, a splendid prospect located 18 miles southeast of Grant's Pass, has been sold by Messrs. Booth, Smith and others to H. E. Huntington. A force of men are at work developing the property. The Golden Eagle, in the Williams Creek district, recently had a cleanup. Some 80 tons of ore were run through, and averaged $20 per ton. The famous Hammersley mine, at Jump-off-Joe, is being operated by the man who discovered it, and the Lucky Bart and Ashland properties are all right. Placer claims everywhere are being worked with good results. The Wimer, Waldo, Simmons and Cameron & Ennis claims, on Galice creek, are proving good producers, the outputs thus far being fully up to the expectations of their several owners. There are many men scattered up and down the various creeks who are devoting all their time to washing out bars."

BRITISH COLUMBIA.

PLACER MINING ON THE FRASER RIVER.—*Mining and Mechanical Review:* M. H. Gibbs, a former Colorado miner, but who for the past few years has been prospecting in the country which recognizes Spokane as its central city, has recently returned from Yale, B. C., where he spent the winter doing a little placer mining and picking up information. Mr. Gibbs says that the gold fever has struck our northern neighbors and there is more activity along the Fraser river and its principal tributaries than there has been since the "golden days of Cariboo." The industry, however, has assumed a different form from that practiced in the early days when the rocker, pan and sluices constituted the method of gold saving, although there can still be seen at various points along the rivers small squads of men panning, rocking and sluicing; the returns are, however, small and the bars are one after another being deserted.

Dredging.—For 300 miles, from Hope to Quesnelle, on the Fraser, the ground has been leased and is being worked or preparations are being made to work it. There are now in operation or building not less than a dozen dredging machines, owned by men of means who have leased large tracts of ground, or, more properly speaking, water (for the dredges are all built on the centrifugal principle), with a view of working it this season and thereafter so long as it will pay.

Between Hope and Yale Messrs. Bell, McCaskell & Shehan have a dredge, the largest on the river, and a strongly constructed boat, with a centrifugal pump to suck the sand and gravel up from the bed of the river, which, with the water, passes through a receptacle charged with quicksilver, which catches the gold and allows the debris and other minerals to pass out. As is the case with all other dredges, nothing is attempted on the banks or above the water line.

At Boston Bar, which is about 25 miles above Yale, another dredger is working. The principle is the same as the one below, but the capacity is less.

At Kanaka Bar, 35 miles from Yale, or about 10 miles above Boston Bar, another strong company is operating with a channel dredge. At Lytton and again near Ashcroft, dredges are working or in course of construction. What the cost of construction or of operation is, or the capacity or percentage of value which is saved by the process, is as yet known only to the operators themselves; it is to be presumed, however, that the results are satisfactory, as several more barges are contemplated at other points along the Fraser.

Hydrauliceking.—There are several hydraulic companies working or preparing to begin on numerous tributaries of the Fraser, on the Lillooet, Bridge river, and Cayuse creek, a tributary of the former stream, where the Horsefly Company is putting in nine miles of iron pipe. There is considerable work also going on at Wilson creek and Willow river. The distances of these streams from railroad connections are: From Ashcroft to Quesnelle, 185 miles; to Horsefly creek, 150 miles; to Wilson creek, 285 miles; and to Willow river, 300 miles. Although the distances named may not be quite correct, they are nearly so.

Barkersville, at one time a live town where flour and bacon was worth almost its weight in gold, and the rendezvous and trading point of the miners of the entire Cariboo country, is assuming some of its former activity. This little frontier post is on the 53rd parallel, is on the old Cariboo trail and on the survey of the Cariboo railroad which leaves the Canadian Pacific at Ashcroft. The distance from Ashcroft by air line is in the neighborhood of 150 miles, but the routes traveled are much longer. The distance from Vancouver is 200 miles farther than from Ashcroft.

Miners are going into the country already in limited numbers, and it is expected that there will be an increasing number as the season advances. There are many of the smaller streams which empty into the upper Fraser which have never been mined systematically. The seasons are somewhat shorter than along the lower river, and in the days when no ground was worked unless it paid very high wages large tracts of good ground were entirely overlooked.

The Cassiar district, which is immediately west of the Cariboo, extends westwardly to the Alaskan boundary line and the Pacific coast, and has produced considerable gold, but the greater portion of the territory embraced within its limits is entirely unexplored, and may or may not be rich in gold treasure. It is reasonable to suppose, however, that there is a large and rich gold field covering a greater or less portion of it, for so far as explored from the Cariboo side, from the coast and from the south, together with the evidence of rich placers along the Yukon, some of the sources of which rise in this great unexplored territory, it can scarcely cease at the imaginary line of its boundary or at the limit of its explored district; in fact, the recent surveys made by the Canadian Geological Engineers along the Yukon and MacKenzie basins bear us out in this assertion, for gold was found at several points and in paying quantities. That prospecting in this far northern and isolated region, which is devoid of roads or trails, will be laborious and dangerous, will not deter the prospector but will add new zest to the task which he lays out for himself. The gold output in British Columbia no doubt will be greatly augmented during the next few years.

Electrical Progress.

The History of the Storage Battery.

Mr. Meyer Bloomfield asserts that uo other science preseuts such a variety of subjects for toil and thought as that of electricity, oue of the most important of which is the storage battery. Though the present applications of this battery are comparatively slight, its future usefulness seems so evident that it may be of interest to review its history aloue, and to take a look ahead iuto the future.

The storage of electricity, or rather the possibility of creating and retaining a potential difference within a glass or metallic vessel, first evinced itself in the discovery of the Leyden jar, which occurred in 1745. But this discovery, further than to show the possibility of electrical storage, has but little to do with our subject.

The observation of polarization in a simple cell led to some experimental investigations by Ritter and Gautherot, in the early part of the present century, the result of which was that the latter, in 1801, demonstrated the principle of electrical storage by immersing two plates of the same metal in acid, and having subjected them to the action of an electric current in one direction, connected the plates to a galvanometer and observed the production of a secondary current in an opposite direction.

In 1842 Grove constructed a gas battery, on the principle that the oxidization of the copper anode in an electrolytic cell produces electrical storage, which consisted of a three-necked flask, containing acidulated water, into which was inserted two inverted tubes containing respectively oxygen and hydrogen. Platinum wires sealed into the upper ends of these tubes were connected with platinum electrodes in contact with the gases above and the water below, thus the external circuit was completed through copper conductors whose terminals dipped into mercury cups. When the circuit was closed the gases recombined to form water, thus generating an electric current, which in the cell flowed from hydrogeu to oxygen and externally from oxygen to hydrogen, and whose E. M. F. was equal to that required to electrolyze water, so that the storage of electrical energy by chemical decomposition was recovered by chemical recomposition.

Other investigations followed, but in 1859 Gaston Plante's discovery of the special adaptation of lead plates for this purpose, opened the way for the practical use of electrical storage. Plante constructed a cell using as electrodes two large sheets of lead rolled together and electrically insulated from each other by strips of gutta-percha. They were then immersed in acidulated water, in a tall glass jar, and subjected to the action of a battery current supplied by two or more cells. The chemical reaction which followed resulted in creating a difference of potential between the terminals, which manifested itself in the discharge of the cell.

The tedious and expeusive process requisite for the electrical formation of Plante's plates led to the iuventiou of Camille A. Faure, about 1880, of plates prepared by covering sheet lead with a paste made of red lead aud sulphuric acid; the coating being confined to the surface by a covering of paper and by felt placed between the plates, which also served the purpose of insulation. Thus prepared and rolled together, they were placed in a glass jar with acidulated water and the coating subjected to electrolysis, and, with alternation of current, was in a few days changed to a spongy lead of differeut chemical composition than at first, the cell then being ready for practical use.

While the Faure cell could be produced much more ecouomically than the Plante, and was equal to it in electrical energy, it had such scrious defects that its utility was circumvented. The felt preventing the frec circulation of the current and seriously impeding electrolysis, it soon became corroded by the acid and partly removed in patches, and ceased to iusulate. The coating failed to adhere properly, sloughed off, and fell to the bottom. Hence, in a short time, the cell proved worthless. But its invention serving to direct the atteution of men like Brush, Swan and Sellou in this field, resulted iu the iuventious of many greatly improved storage batteries.

The storage battery of to-day. though not perfect, has nevertheless rendered much valuable service. Its applications are varied, and while not as yet very exteusive, they are sufficient to indicate that storage batteries may, in the uear future, occupy a very important place in the electrical industries. A fortune awaits the lucky man who invents a storage battery that will overcome all of the objections to those now in common use; and can confine electricity in cousiderable quantities withiu a small vessel, which will ever be ready to do man's bidding. Verily, the field of the future applicatiou of the storage battery is a vast one.

Troublesome Door-Bells.

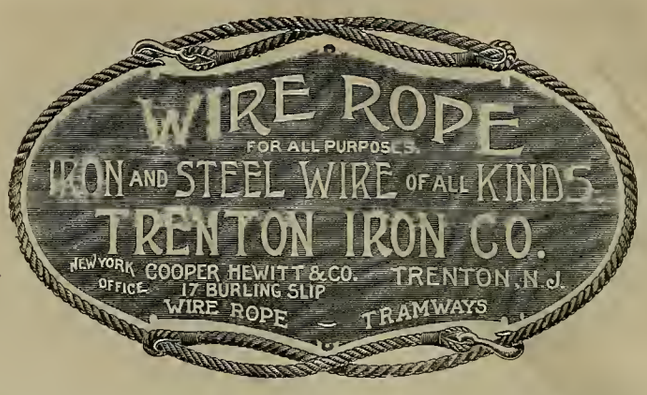
Half the time when an electric doorbell will uot ring its owner can get over the difficulty by shakiug the glass jars or by adding a little water to them. When the jars are placed in a warm corner of the kitchen, which sometimes happeus, there is too much evaporation, and the fluid gets too low to complete the connection and start the bell. Unless the apparatus has been in use some time, this can generally be remedied by adding a tumblerful of water to each jar and gently shakiug the mixture. This is a condition of affairs which is especially indicated when a bell will ring when a button is first pushed in, but ceases almost immediately.

It has been lately shown by Prof. Nichols, the electrician, that in the average incandescent lamp, excepting the latest three-watts-per-candle lamp, the light-giving efficiency is only five per cent of the total energy radiated from the filameut, the remaiuder beiug lost as heat. He has also demoustrated that the superiority of the arc lamp, in the matter of caudle power per horse power, is not nearly so great as has been commonly assumed; so that, although the arc lamp may, when measured in the best and most favorable position, devclop six aud seveu times as much light per horse power as the incandescent—when their mean spherical iutensities are compared—the actual difference otherwise is far less, aud the ratio is reduced to only two to one in favor of the arc lamp. On the other hand, however, arc lamps are usually placed in such a positiou as to bring their best light-giving value into practical effect. In order to avoid the difficulties which have been met with in the method of measurements for the light-giving value of illuminants, Prof. Nichols suggests such a change as will take accouut of the fact above noted, viz., that the candle power of a lamp does not represent its light-giving value, and, iu the case of the incandescent lamp, temperature and area of radiatiug surface should be made account of.

Usually Overstated.

So far from a bullet fired from an Euglish magaziue rifle having an impact weight of several huudred weight, as many seem to believe—one wiseacre states that a half-ounce bullet strikes a blow 500 yards from the muzzle of the rifle equal to about one aud a half tons—it only has au impact of a few pounds weight.

According to W. B. Wallace of the Suffolk Regiment, who seuds to the *Daily Graphic* an interesting calculation in dynamics to show how the force of a Lee-Metford bullet striking the cuirass worn by Dowe is dissipated, the kinetic energy imparted to the cuirass is only equal to four foot-pounds. If a person were to lie on his back, and the cuirass were dropped ou his chest from a height of four inches, it would equal the blow given to Dowe when struck by the bullet ou the cuirass.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The First CRAWFORD Mill in Oregon has been erected at the Red Boy mine. Trial run of 22 days showed 220 tons treated, yielding over $3000, bullion, a saving of 85 per cent. Wear and tear, 20 cents per ton. No plates or screens. Simplest, cheapest and most economical mill on the market. *Special terms offered the first mill introduced in any mining district.* Oregon Agent, E. J. GODFREY, Baker City. Full particulars from

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Special attention given to the purchase of Mine and Mill Supplies.

Practical Information.

Table of Principal Allyos.

A combination of copper and zinc makes bell metal.
A combination of tin and copper makes bronze metal.
A combination of tin, antimony, copper and bismuth makes britannia metal.
A combination of tin and copper mates cannon metal.
A combination of copper and zinc makes Dutch gold.
A combination of copper, nickel and zinc, with sometimes a little iron and tin, makes German silver.
A combination of gold and copper makes standard gold.
A combination of gold, copper and silver makes old standard gold.
A combination of tin and copper makes gun metal.
A combination of copper and zinc makes mosaic gold.
A combination of lead and a little arsenic makes sheet metal.
A combination of silver and copper makes standard silver.
A combination of tin and lead makes solder.
A combination of lead and antimony makes type metal.
A combination of copper and arsenic makes white copper

Difficult to Get.

The discovery of deposits of platinum in this country would be as welcome as the finding of a diamond mine. At present the metal costs nearly half as much as gold, having risen greatly in price within the last three years. It is absolutely indispensable for many purposes, being non-corrosive and resisting acids.

It is utilized for chemical apparatus, scientific instruments and incandescent lamps. There is some platinum in the beach sands of Oregon, but not enough to pay for mining. Small quantities of it have been discovered recently in the copper mines of Canada, where it occurs in a combination with arsenic.

Two-thirds of the world's supply of platinum comes from two Siberian mines in the Ural mountains. The metal is obtained there as a by-product of gold mining. The mining is done by scooping holes in the ground to a depth of about 15 feet, and then burrowing, rat fashion, in all directions. Twenty-nine hundred cartloads of earth are required to yield 15 pounds of platinum. The biggest nugget ever found was about the size of a tumbler.

G. W. DUN, the naturalist, referring to a probable cause to the extinction of many "night gas lights," says: "The moth miller is causing many deaths, and people would do well to look out for them. They are harmless looking, but very dangerous. San Francisco is, though a large city, full of these moth millers. The average man does not see a moth miller, though it flies before him half a dozen times. He has not trained eyes for such things. The only way he knows the millers have been around is when he discovers his clothes cut to pieces. It is the millers rather than the little gusts of wind that put out the gas. As soon as a moth sees a light it makes for it. Most people on going to bed leave a jet or two burning very low. At the same time the window sash is up or down; therefore, when a miller sees the jet he finds easy access to it. A single flip of his wings is often enough to extinguish it. The result is that the gas quickly fills the room and asphyxiates the sleeper. No wonder that no note is left and no reason can be assigned for the death. It is a mystery for which the moth miller is responsible."

IN 1893 manganese ores were produced in five States—Arkansas, California, Georgia, Tennessee and Virginia. In 1892 three States produced manganese ores—Arkansas, Georgia and Virginia. The Georgia production declined from 826 tons in 1892 to 724 tons in 1893, and the Virginia production declined from 6079 tons in 1892 to 4092 tons in 1893. California and Tennessee produced, respectively, 400 tons and 482 tons in 1893.

No. 5.
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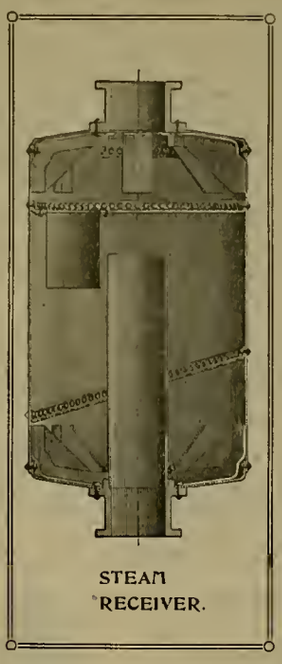
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Columbian Half Dollars.

Among the subsidiary coin turned into the various Sub-Treasuries of the country appear from time to time Columbian souvenir half dollars. These coins, under the act authorizing their issue, are a legal tender in amounts of $10 or under. They are taken at the Sub-Treasuries, of course, at their designated value only, whereas they cost the careless or forgetful persons who put them into circulation from $1 to $2 apiece. But three of the 50c pieces have been thus presented at the New York Sub-Treasury, and none of the Isabella quarters have made their appearance. The Sub-Treasury in this city has received some of both. There were $2,500,000 of the Columbian half dollars coined, making a total of 5,000,000 pieces. The quarters are of great rarity, but $10,000 worth, or 40,000 pieces, being coined.

The Iron in One's Body.

A lecture, presumably scientific, was delivered in a hall in Philadelphia recently, the lecturer stating that the human body contained enough iron to make a plowshare. There are about 100 grains of iron in the average humau body, and yet so important is this exceedingly small quantity that its diminution is attended with very serious results. The man who thus talks about the quantity of iron in the system probably knows as little about the human body as he does about the weight of a plowshare.

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The German Savings and Loan Society,
526 CALIFORNIA STREET.
For the half-year ending June 30, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after MONDAY, July 2, 1894.
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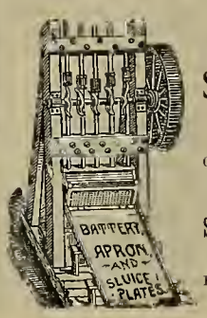

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Market Reports.

The Markets.

SAN FRANCISCO, July 12, 1894.

The general demoralization consequent upon the tie-up of the country's business seems not to affect the silver market, which fluctuates between 62 and 63, the causes which lie at the bottom of these low prices transcending in latitude and longitude even the limits of this nation. Copper is still depressed, the price unvarying from the preceding week. During June 725 flasks quicksilver were received here. The receipts for the first six months of '94 were 12,405 flasks; for the corresponding period in '93, 12,575. The exports for the same time in '94 were 8572 flasks, worth $251,794; for the first half of '93, 9259 flasks, worth $377,993.

New York Prices.

NEW YORK, July 12.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	28¾	62½	....	....	....
Friday	28¾	62½	9 00	3 20	19 50
Saturday	28⅝	62⅝	9 20	3 20	....
Monday	28¾	62½	....	....	....
Tuesday	28¾	62¾	9 20	3 20	19 50
Wednesday	28⅝	62½	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½c
New York Telegraphic Transfer	15c
London Bankers', 60 days	$4.88
London Merchants	$4.86¾
London Sight Bankers'	$4.89¾
Refined Silver, per ounce	62½
Mexican Dollars, nominal	52@52½

A London cablegram says: The stock markets were still stagnant but marked by a more cheerful tone. Americaus closed near the best. The difficulties apprehended in tomorrow's settlement is not connected with the American market. South American stocks improved on a fall of six points in the Argentine gold premium. The Indian Council sold 55 lakhs of rupees to-day at rates ranging up to 12 29-32.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¼
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2½
Norway, base	—	@	4½
PIG IRON.		Spot.	
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	— —	@	— —
Shotts, No. 1	23 50	@	— —
Puget Sound	— —	@	— —
Clay Lane White	22 50	@	— —
Langloan	22 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	22 50	@	— —
Cargoffeet	— —	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10
QUICKSILVER.			
Home trade, per flask	35 50	@	35 75
STEEL.			
English, lh	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lh	23	@	23½
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			6 00
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			7 75
Brymho			7 25
West Hartley			7 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 50	@	— —
Cardiff	7 50	@	— —
Lehigh Lump	17 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	9 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, July 12, '94.

The tie-up has excluded mining stock buying and selling as completely as any other industry. Prices were fairly steady, but the volume of business was very small. Some Comstock superintendents are here who want to get home, and others are home who want to get here. The railroad paralysis compels a return to primitive means of communication. Nevadans drive by stage and private conveyance via Placerville to Sacramento, and there take boat for this city. At the annual meeting of the Best & Belcher Mining Company 78,076 shares were voted. Directors and officers were elected as follows: George R. Wells, president; Charles H. Fish, vice-president, and E. B. Holmes, H. Zadig and W. R. Sherwood, directors; P. Kervin, superintendent, and M. Jaffee, secretary. At its annual meeting the Company of Associated Stock Brokers of the San Francisco Stock and Exchange Board re-elected the old directors: George C. Hickox, A. W. Foster, J. M. Shotwell, George T. Marye and H. L. Van Wyck.

The Alta assessment delinquent sale has been postponed to July 30, and the Union Consolidated to August 6th.

The ease of Andrew Crawford vs. the Mount Moriah Quartz Mining Co. has been dismissed. The claim was on an alleged agreement for the purchase and sale for $20,000 of quartz locations on Little Wolf creek, Sierra county.

The North Star Mining Company has voted to increase the capital stock of the company from $1,000,000 in 100,000 shares to $2,000,000 in 200,000.

The superintendent of the West Cou. Virginia & California reports his men engaged in easing timbers in the north drift, 1100 level, having been unable to get to the face of west crosscut on account of a heavy flow of hot water, which was encountered on the first. The ground is sufficiently drained to permit work in the face. The west crosscut run from a point 320 feet north of the shaft station is now in a total distance of 978 feet. Face in hard porphyry, carrying seams of quartz.

The following illustrates the changes of the week:

MINES.	5	12
Utah	....	....
Sierra Nevada	....	....
Union	30	$ 32
Mexican	57	49
Ophir	1 55	1 60
Consolidated California and Virginia	2 65	2 90
Best & Belcher	96	1 05
Gould & Curry	51	45
Savage	30	32
Hale & Norcross	51	....
Chollar	25	....
Potosi	38	45
Bullion	12	....
Exchequer	....	....
Alpha	....	10
Confidence	65	....
Yellow Jacket	....	42
Crown Point	49	57
Belcher	59	74
Overman	11	11
Justice	11	12
Alta Consolidated	26	21
Consolidated New York	....	5
Challenge	30	35
Bodie	1 45	1 30
Andes	38	42

San Francisco Stock Board Sales.

SAN FRANCISCO, July 12, 1894.

FIRST SESSION—9:30 A. M.

200 Alta	20	500 Con New York	5
60	21	200 Crown Point	48
300 Belcher	60	400	49
300 Bodie	1 25	100 Gould & Curry	45
300	1 30	150 Mexican	49
100 Bulwer	24	220 Ophir	1 60
150 Challenge	30	600 Overman	11
50 Con Cal & Va	2 80	500 S B & M	3
500	2 85	100 Yellow Jacket	40

SECOND SESSION—2:30 P. M.

150 Alpha	10	500	2 85
50 Andes	42	500 Crown Point	57
100 Belcher	73	100	56
100	74	600 Justice	12
345 Best & Belcher	1 00	200 Ophir	1 60
100	1 05	200 Potosi	43
100 Bodie	1 30	200	45
350	1 25	100 Savage	32
100 Challenge	35	200 Seg Belcher	2
100	34	100 Union	32
175 C. C. & Va	2 90	200 Yellow Jacket	42

A Smelter in the Kootenay.

Despite the severe setback which silver recently received, it would appear that there are men who still have confidence in the future of at least one section of the British Columbia mining regions. The formation is just announced of a company which proposes to erect aud operate a large smelter in the Kootenay country. A paid-up capital has been subscribed in New Haven, Conn., Minneapolis and Victoria, B. C.; to the amouut of $2,250,000 for the purpose of carryiug ou the enterprise aud the work is already well under way.

The compauy, which will be knowu as the Kootenay Miuing and Smelting Co., has secured a location at Pilot bay, the geographical center of the Kootenay country. At this point the plant will be of easy access alike to the high-grade silver-lead ores of the Slocan and the copper, silver and lead of Ainsworth, Nelsou and vicinity. The plaut will accommodate four stacks of 100 tons capacity each and the works will iuclude a 300-ton sampling plant, a 200-ton concentrator, a refinery capable of treating all the bullion produced, and a fine laboratory and assay office. Seven of the buildiugs have already beeu completed for the works and three others are under way at the present time. Over 200 tons of machinery have beeu received and are being placed while several carloads are on the way. The works will be in operation by the 1st of October with a 100-ton stack for the handliug of silver-lead ores and the others will be added as required.

The promoters of the scheme are busiuess men—E. W. Herrick of Minneapolis is the president of the new company; R. P. Rithet, vice-president; Joshua Davies, E. Crow Baker, W. H. Ellis, W. P. Sayward, W. J. Macaulay, James Hutchesou and Headly Chapman. Andrew B. Hendryx is business manager.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Bulwer Cons M Co, Cal	9	10c	May 24,	June 29, July 27	L Osborn, 309 Montgomery
Conlon G M Co, Cal	2	5c	May 26,	June 30, July 20	T Lynch, 26 Montgomery
Eclipse M Co, Cal	8	2c	June 8,	July 10, July 31	Otto Tum Suden, 530 California
Evening Star M Co, Cal	14	1c	June 5,	July 14, Aug 4	J J Scoville, 320 Sansome
Mexican G & S M Co, Nev	50	25c	June 12,	July 17, Aug 7	C E Elliott, 79 Nevada Block
Occidental Con M Co, Nev	16	10c	May 31,	July 5, July 31	A K Durhrow, 69 Nevada Block
Osborn Hill G M Co, Cal	3	15c	July 7,	Aug 7, Aug 28	R R Grayson, 331 Pine
Seg Belcher & Mides M Co, Nev	14	10c	June 12,	July 16, Aug 6	E B Holmes, 309 Montgomery
S Eureka M Co, Cal	11	1c	May 15,	June 25, July 16	A Halsey, 328 Montgomery
Union Cons M Co, Nev	49	15c	June 20,	July 25, Aug 15	C C Harvey, 309 Montgomery
Virginia Cons M Co, Cal	11	½c	May 14,	June 20, July 16	A F Benard, 26 O'Farrell

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Altoona Q S M Co, Cal	Special	C Allenberg, 630 Brannan	Aug 16
Lady Washington M Co, Nev	Annual.	J E Jacohus, 309 Montgomery	July 25
Savage M Co, Nev	Annual	E B Holmes, 309 Montgomery	July 19
Union Cons S M Co, Nev	Annual	C C Harvey, 309 Montgomery	July 16
Yellow Jacket S M Co, Nev	Aunual	G D Edwards, 414 California	July 16

Coast Industrial Notes.

—A new dynamo and other machinery has just been added to the Mount Lowe Railroad at a cost of $8000.

—The Colton Cement Works have put on an additional force of men, and expect soon to have 300 at work.

—Over 25,000 feet of insulated copper wire will be used in the electric wiriug of the new French hospital on Point Lobos avenue in this city.

—The steamer Bawnmore has arrived from Peru with 2680 tons crude petroleum for Grace & Co., being her second cargo from the S. A. coast.

—It is thought 40,000,000 pounds of sugar beets will be produced in California this season—Chino district, 17,000,000 pounds; Watsonville district, 19,000,000; Alvarado district, 4,000,000.

—The stockbolders of the Market Street Consolidated Railway Compauy of this city have authorized the issuance of $17,500,000 in bonds to extend the lines and operations of the company.

—The Seattle Canal Company has perfected plans for cutting a caual from the south end of Lake Washington to Elliott bay. The cost will exceed $3,000,000. Work is to begin November 1st.

—A State federation of real estate men has been organized to be in operation by the first of next mouth. The central bureau is to be located in San Francisco, with county and district branches throughout California, wherever people can be found to aid in the scheme.

—The U. S. and Mexican Government have a joint commission journeying down the Colorado from Yuma, the idea being to make a thorough examination and report to their respective Goveruments on the feasibility of dredging the river to its mouth, so that deep water vessels cau go to Yuma.

—Joseph Colby, president of the Puget Sound Reduction Works, has removed to Everett from New York and will assume management of the company's interests at that point and at Monte Cristo. One hundred men are at work rebuilding the tramway from the mines to the concentrator, which was wrecked by suowslides some time ago.

—On the Pacific coast there are 134 salmon canneries, 38 of which are located in Alaska, 39 in British Columbia, 23 in Washington, 24 in Oregon and 9 in California. There are 24 canneries on the Columbia river, equally divided in number between the Washington and Oregon side, and the same number of canning institutions also operate on the Fraser river in British Columbia.

—There is a rapid development going on in canal building in Arizona. The territory will be enriched during the next six years with $8,000,000 in canals alone. The storage reservoir of the South Gila Company is considerably larger than the bay of San Diego. The Verde Company has just let a $2,000,000 contract for its dam and canal. The Colorado Irrigation Company's canal will cost $5,000,000.

—The Colorado River Irrigation Company has concluded arrangements to raise capital for the building of its great canal on the desert, in San Diego county. Gen. L. A. Grant is president of the company and J. C. Beatty vice-president and general manager. They have obtained rights to water of the Colorado river to irrigate thousands of acres on the desert, and many square miles of land have been acquired. Preliminary surveys have been made, and for miles the company will utilize the canals cut by some prehistoric people, which have been found along and below the Mexican line, dug according to engineering rules and conforming to the topography of the country. The project of the present company is on a big scale, and is the greatest engineering and irrigation scheme of the continent, being intended to reclaim over 500,000 acres of land.

Are You Interested in Mines?

There is to-day no mechaniical appliauces in use about a modern stamp mill of such great value in the saving of precious metal in the ore as concentrators, and, such being the case, the iuventive minds of mechanical men have been taxed to improve upon those appliances now in use in the mines throughout the western coast, and elsewhere.

One of the best concentrators of to-day, and which is in general use, is the Frue Ore Coucentrator, or Vanuer. This is one of the oldest machines in the market, over 4000 of them being in actual use at the present time, not only on this coast, and the east, but throughout the entire world.

From time to time valuable and important improvements have been made in the Frue Vanner, thereby greatly increasing the capacity, and adding to its durability. The most uotable among these improvements beiug the Brownell patent or "lip" flauge for rubber belt, whicb doos away with nearly all the straiu and cracking, as in the old style of flange, making the life of the belt more thau double that of other style belts. The lip of flange bending outward causes the flange to flatteu down when going over the large rolls, thereby distributing the strain in the solid rubber, and bringing virtually no strain, either at the edge or at the base of flange, as is the case in all belts with a raised edge. This makes the Brownell flange superior to any in the market.

Samples of this new flauge can be seen at the office of the Frue Vanning Machine Co., Jas. S. Brownell Western Agent, 132 Market St., San Francisco, Cal. *

BOOKS ON ASSAYING.

BY C. H. AARON.

Part I.—Gold and Silver Ores.

SECOND EDITION—PRICE $1.

This work is written by an experienced metallurgist who has devoted many years to assaying and working precious ores on the Pacific side of the American Continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the scientist nor the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications ("Testing and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular" is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12mo. pages, with illustrations, well bound in cloth; 1889. Price, $1, postpaid. Sold by DEWEY PUBLISHING CO., Publishers, No. 220 Market Street, San Francisco.

Parts II and III.

Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Etc.

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This book is entitled "Assaying—Parts II and III," and is separate from Part I, and treats of Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Zinc, Nickel, Cobalt, etc.

Table of Contents:

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One of the methods given for the Assay of Copper is new, original and exact, as is also one of the processes for Zinc.

The book contains 161 pages with illustrations, and is strongly bound in cloth. Much of the original text is replaced by new matter.

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All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS

was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891.

MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. Price $575 f. o. b. Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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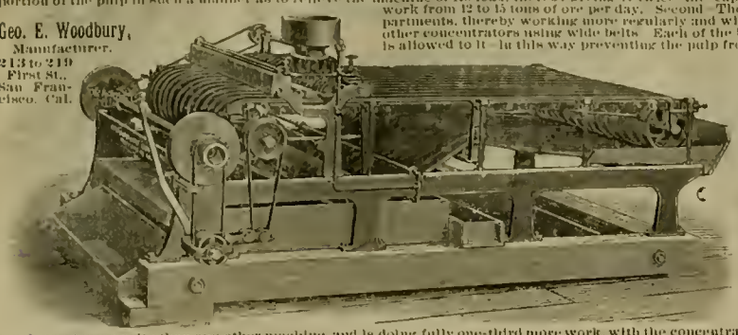

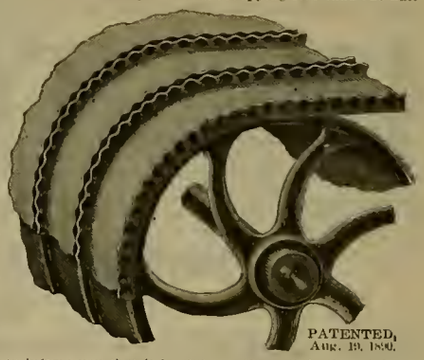

PATENTED, Aug. 19, 1890.

THE SAN JACINTO ESTATE—Office of the General Manager. Cajalco, Oct. 30, 1891.

GEO. E. WOODBURY, Esq.—Dear Sir: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the concentrates equally clean, as from either of the machines at work here. [COPY.] Yours faithfully, S. HARRIS, Manager.

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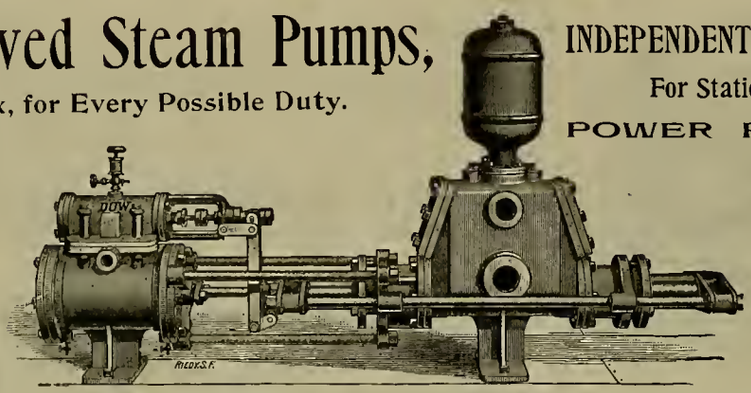

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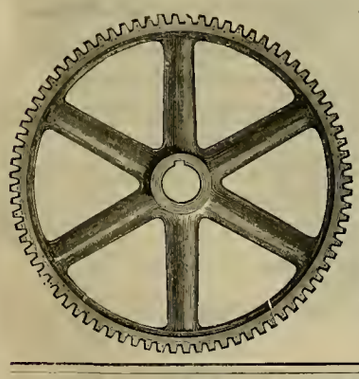

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PUMPS TWICE AS MUCH WATER AS THE OLD PLUNGER. Only about one-third the weight of the old Plunger. Special construction of steel for packing on mules, only one-twelfth the weight of the ordinary Plunger. First outlay one-third less; works with 10 per cent less power.

IMPROVED SINKING PUMP.—Bucket and clack changed under water. Bucket lasts six times as long as the old one, saving expense of putting down another pump where bucket and clack cannot be changed under water. The self-tightening and self-lubricating stuffing box and new bucket also saves expense of dropping extra pumps. WM. NANCE, Grass Valley, Nevada County, California.

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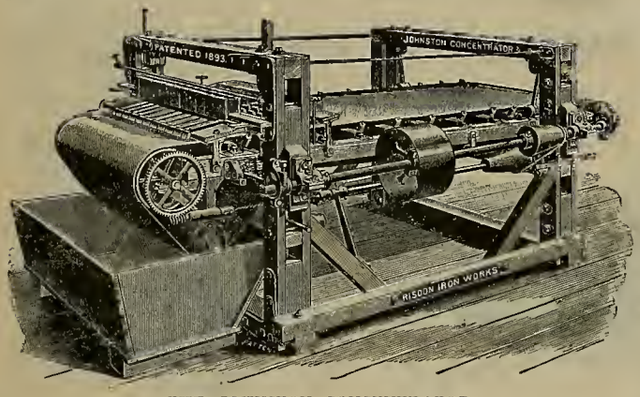
SIMPLICITY OF CONSTRUCTION. ✦✦ GREAT DURABILITY. ✦✦ EASE OF OPERATION. ✦✦ INCREASED PERCENTAGE OF SULPHURETS SAVED.



THE JOHNSTON CONCENTRATOR.

(EXTRACT.)

GOLD BLUFF MINE,
DOWNIEVILLE, CAL., Jan 24, 1894.

RISDON IRON WORKS:—The machine has the same monotonous record, i. e., they absolutely save all except traces of sulphurets. Ship Two more as soon as possible. Respectfully, W. KRAFT, Superintendent.

(COPY.)

SAN FRANCISCO, CAL., June 1, 1894.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco:

GENTLEMEN:—We have tested the Johnston Concentrator furnished us by you on trial; and after an exhaustive test, we are satisfied it is the best in the market. Please prepare and ship us, as soon as possible, THIRTEEN more machines.

Yours truly, APOLLO CONS. MINING CO.
[Signed.] By LEON SLOSS.

—MANUFACTURED BY—

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MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 3.

SAN FRANCISCO, SATURDAY, JULY 21, 1894.

THREE DOLLARS PER ANNUM Single Copies, Ten Cents.

Gold-Milling at the North Star Mine, Grass Valley, Cal.

(Concluded from last issue.)

Figure 4, on page 38, gives in detail the battery frame in elevation. For the several blue prints, from which these engravings have been made, I am indebted to Mr. R. S. Moore, superintendent of the Risdon Iron Works, San Francisco.

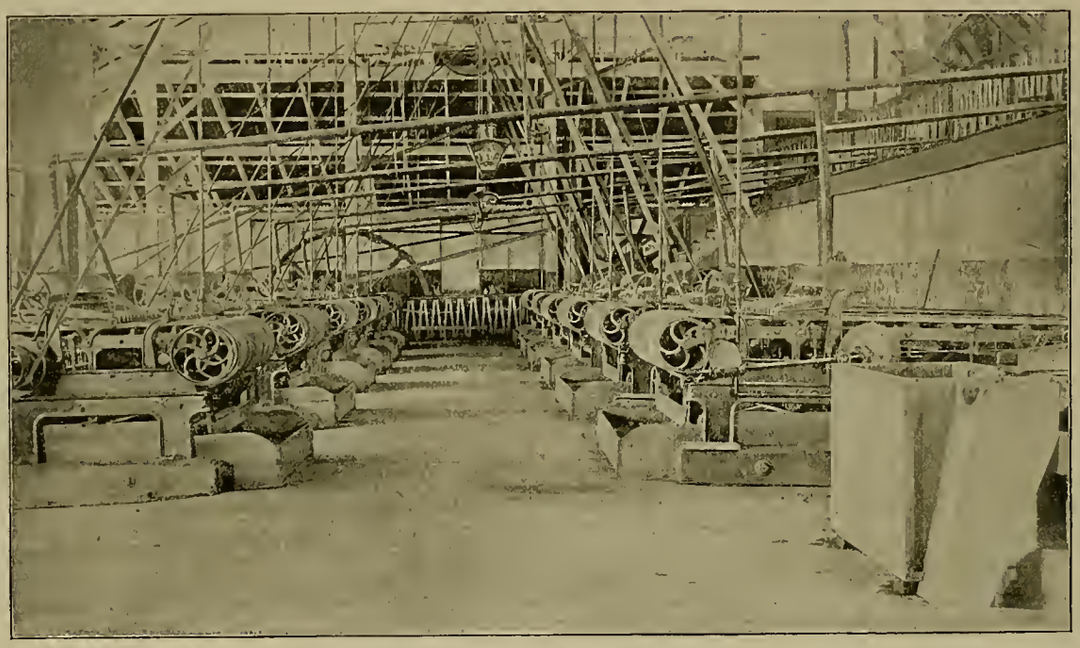
The mill contains 40 stamps, weighing, when newly shod, 875 pounds each. The stamps drop seven inches 86 times per minute. The shoes (steel exclusively used) weigh 159 pounds, and the remaining 716 pounds of the stamp are distributed as follows: Stem, 358 pounds; stamp-head, 228 pounds; tappets, 130 pounds.

The life of a steel shoe averages 130 days, and it crushes during that period 260 tons of ore. The weight of the shoe, when removed, will average about 38 pounds. The very smooth and uniform wear observed on these shoes is due in great measure to the use of cast-iron dies.

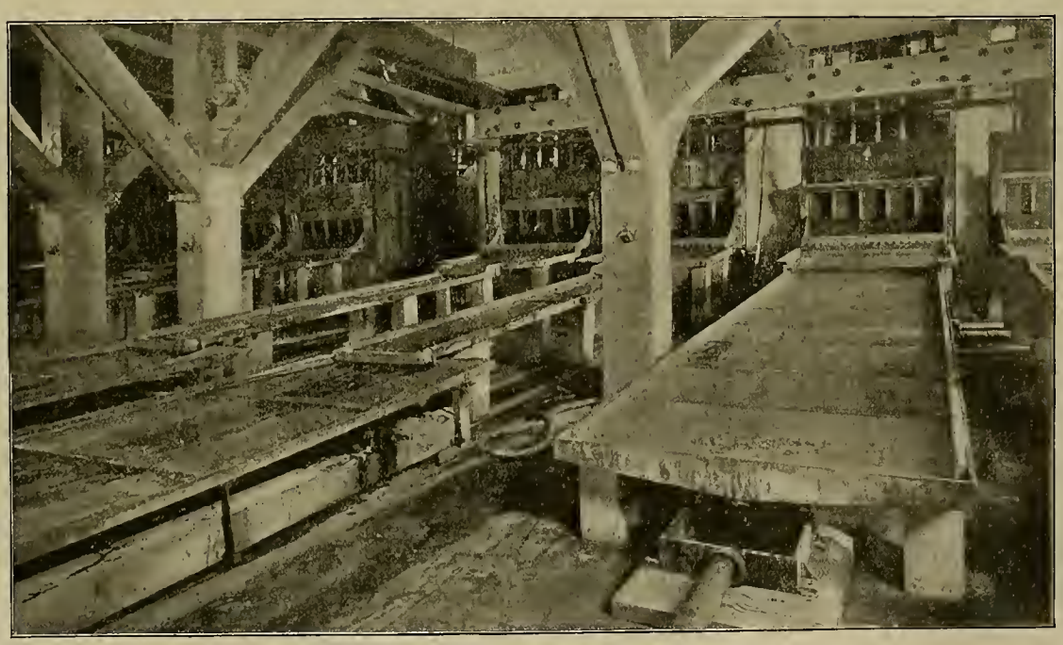
The weight of the die when new is 100 pounds, and it loses during a life of 70 days one-half its original weight. The recent introduction of cast-iron plates two inches thick has increased the life of the die to 80 days, the die, when removed, weighing from 40 to 45 pounds. These plates, two in number to each battery, fit snugly in the mortar, forming a false bottom, upon which the dies are bedded as usual. They serve a double purpose, prolonging the life of the dies and decreasing the height of the discharge, which ranges from an initial of four inches to a maximum of six inches.

Brass wire No. 30 screens and perforated No. 0 tin screens are used exclusively. The latter screen is an experiment, and thus far has given good results. The life of a tin screen is about 30 days; the cost, one-fourth that of wire screens. At the North Star mill, in crushing 113,755¼ tons of ore, the cost for screens has been $0.008 per ton. Dies have cost $0.026 and shoes $0.056 per ton, exclusive of a rebate of 1½ cents per pound on removed shoes and dies.

The recovery of gold is first made in the mortar, where the amalgamation begins. Mercury is fed to the batteries at regular intervals, the amount varying with the grade of the ore crushed. At times, this amount has exceeded one pound per battery, or a flask of 76½ pounds in nine days. Of this amount, however, 35 per cent is recovered at the fortnightly retorting of amalgam. There is, however, a considerable loss of quicksilver, which, in treating 113,955¼ tons of ore, has amounted to $3680.05 or $0.032 per ton. In the interior of the mortar, under the screen-frame, are silver-plated copper plates 4½ inches wide by 52 inches long. These plates, one for each mortar, are bolted to chuck-blocks fitting tightly against the lip of the mortar, as shown in Fig. 5, on page 38, a section of a single-discharge mortar used at this mill. As the pulp is discharged from the mortar through screens, it falls upon an outside battery or splash-plate 18 inches in width, covering the iron mortar-apron, which is bolted to the mortar and forms part of it. The length of this plate is equal to that of the inside plate.



NORTH STAR MILL — CONCENTRATOR-FLOOR.



NORTH STAR MILL — OLD AND NEW APRON-PLATES.

The apron-plate, 48 by 58 inches, lies below the splash-plate, tapering to 24 inches and connecting with the three sluice-plates which cover the sluice 12 feet long and 24 inches wide. From the sluice, the pulp passes over shaking-tables, which have a plated surface of 10 feet by 48 inches, made up of two plates 48 by 36 inches and two smaller ones, each 48 by 24 inches.

The grades of the above plates are as follows: Battery and apron-plates, 1½ inches to the foot; sluice-plates, 1¼ inches to the foot; shaking-tables, 1 1/16 inches to the foot. The natural tendency of the narrow sluice-plates to "scour" has always been objectionable, and in fitting the more recently erected batteries with a line of plates, the width of the sluice has been doubled. These plates, eight in number, are placed side by side, and overlap slightly, aggregating 15¾ feet by 4 feet wide, the total actual plate-surface being equal to that of the narrow sluice-

(Continued on page 38.)

MINING AND SCIENTIFIC PRESS.

Office, No. 220 Market Street, Northeast Corner Front, San Francisco.
Take the Elevator, No. 12 Front Street.

Terms of Subscription.

Annual Subscription, $3. New Subscriptions will be declined without cash in advance. All arrearages must be paid for at the rate of $3.50 per annum.

Advertising Rates.

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Our latest forms go to press on Thursday evening.

San Francisco, July 21, 1894.

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Now that Utah is to be a State, it is in order to do likewise for Arizona.

After a blockade of seventeen days it is a pleasure to once more get into communication with friends and patrons near and far by mail.

Lieut. H. W. Turner, of the U. S. Geological Survey, is in Butte county securing material for a map of the Sierras in that part of the State, which will be of value to every resident of northeastern California.

In the recent tremendous flood in the northwest all the snow didn't melt. The unusual snowfall is expected to insure a good placer mining season in British Columbia, Idaho, Washington and Montana, with a corresponding increase in the gold yield.

Southern Oregon shows considerable present activity in mining, more prospecting now being done in that section than ever before. It is calculated that in the Medford district alone, over $600,000 in gold was taken out last year.

Colorado is discovering that not every man who writes "M. E." after his name is entitled to the honorable appellation of "Mining Engineer." Fortunately for the best interests of mining such quacks and empirics in the metallurgical field are quickly detected and turned down.

The words "drift" and "crosscut" are not interchangeable, though one or two of our contemporaries by their use would seem to think so. In this connection it is to be borne in mind that a "drift" follows the vein, a "crosscut" intersects it, cutting across it at an angle more or less acute.

It is reported that last Tuesday the owners of the Utica-Stickles mine were offered and refused $6,000,000 for their mine. That property is but an example of hundreds of others throughout California that await development. Less than two years ago it could have been secured for less than $20,000.

At Mercur, Utah, the Marion Company has quit the process formerly in use, and is retorting the gold product of their mill. The local papers think the Mercur will shortly do the same. Formerly shipment was made to Omaha, but it is now about decided to complete on the spot the entire process of reducing the sulphides to bullion.

During the height of the strike A. N. Towne telegraphed to C. F. McGlashan of Truckee to ask if in his judgment it would be safe to try to run a train through Truckee, protected by Deputy Marshals. Mc wired back that there were not enough Deputy Marshals in the United States to run a train through Truckee, but he changed his mind later on.

As compared with ten years or more ago there is far less money wasted in mining schemes than formerly. Intelligent action and investigation now save many costly blunders, and even where new conditions prevail information is obtainable that will prevent financial disaster. It is largely a man's own fault if he loses money in mining projects nowadays. In such case it is either a willful gamble or an investment made on insufficient or unreliable statements, as often occurs in any other line of business.

"Why," it is asked, "is it that Con. Cal. & Va. is quoted so much less than it was ninety days ago, when, according to the official showing, it is really more valuable than three months ago?" To give a complete answer would transcend ordinary newspaper space. Confidence in the management of a mine has often as much to do with the figure at which its stock is quoted as the value of the mine itself. Very often the price of the stock of even a dividend paying mine is an exact reflex of the mine's management.

Money is going begging for investment in this city at from four to six per cent. Meanwhile, in a thousand promising localities throughout the mining area of the State, are good mines that, developed, would yield a hundred times the investment. Were more men able to divest their minds of the old superstition that there is a gamble, an uncertainty and universal risk about mining investments, it would be better for the State. Mining is now as legitimate and certain a form of investment to the intelligent man of means as any other business.

The Senate has passed the House bill suspending for the year 1894 the provisions of the Revised Statutes of the U. S., which require that $100 worth per annum of labor shall be performed or improvements made on each located mining claim during the term before the issue of patents, being a repetition of the bill passed on the 3d of Nov., '93, regarding similar work for '93. By filing before Dec. 31st, 1894, a notice that the claimant intends in good faith to hold and work his claim, he is exempted from the usual requirements for this year.

During the present labor troubles president Debs in Chicago and chairman Knox in Sacramento, the labor leaders in the strife, issued sundry peace proclamations which read very well. It has been proved at Debs' examination in Chicago that he sent private telegrams advising his adherents to save their money and buy guns. The Willows *Journal* says:

On July 7, 1894, at 12 o'clock M., a party in this town received the following telegram from Sacramento, signed by Mr. Knox of the American Railway Union:

We need financial assistance, but armed assistance would be more acceptable.

It must not be supposed that because the mining stock market is dull the mines are lifeless, too. Reference to our weekly summary of mining news condensed from the local press of the State and coast shows that the utmost activity prevails, new mining communities are clustering round recent discoveries, old mines are being put in process of proper development, steady producers are yielding regular dividends, and that, too, with very little fuss being made about it. No industry has suffered so little from the year's depression; none is in better shape or brighter promise for the general improvement that so surely awaits us.

It is a pleasure to know that by skill the builders of the Government vessels are even exceeding the rigid requirements of the Government in the matter of speed. Recently the Union Iron Works of this city earned a $300,000 bonus by exceeding the speed requirement, on the basis of $50,000 for each quarter knot over the maximum. Now the builders of the Minneapolis have earned $414,600 in premiums, by succeeding in developing a speed of 23.07 knots on her trial trip—21 knots being required. That is equivalent to about twenty-six and a half miles an hour, which is considerably better time than some of the railways have been making lately.

Drift Mining in California.

The western slope of the Sierra Nevadas in this State, from Mariposa to Siskiyou, contains the great area in which drift mining in California is practicable and profitable. In Nevada, Placer and Sierra counties is found the richest ground, though Plumas, Butte, El Dorado, Amador, Calaveras and Tuolumne counties have many important drift mines. There is almost a uniform geological character to this entire district, the main axis of the great mountain range from its summit thirty miles westward being granite. Westward to the Sacramento and upper San Joaquin valleys occur almost uninterruptedly metamorphic stratified rock, slate and limestone forming the largest part. Research indicates that the prehistoric rivers that ran through this region were wide and deep but comparatively short. Occasionally are found two lines of those ancient channels bisecting each other at almost right angles, indicating their distinct and separate formation in periods of time boundless by ordinary computation. In those old days when the world was young, into these old channels filling up with bowlders, gravel and sand, was also washed gold from the quartz veins. The close of this Pliocene period eons of ages ago was marked by a lava flow covering and sealing that auriferous deposit in some cases a thousand feet deep. In the present geologic period the streams now on the surface, trending more straightly westward than their buried brothers, have eroded through this lava, through the ancient debris, and in many cases through the slate. A part of the gold thus brought to light by Nature's slow processes has been secured by man during the past forty-five years. Its source and fountain seat is only to be unlocked by drift mining. Drift mining may be considered as a branch of placer mining. It was in the early days of placer mining that the origin of the placers was discovered. The miners of forty years ago, as their placer claims were being worked out, naturally looked eastward and upward to the hills, and working higher came to places beyond which no surface trace of gold was found, the gravel "vein" running into the mountain. In tunneling on the bedrock they found it pitched downward as it went into the mountain, the result being that they were ordinarily drowned out. This was the incipiency of drift mining, the plan adopted being running tunnels on an up grade from the lowest practical point, thus draining the drift and making it easier to move the gravel.

There is no field more promising of returns than the development of drift mines. The preliminary cost of such development can be greatly lessened by judicious expenditure at the start in securing intelligent survey of the ground proposed to be worked. Proper platting of the probable course and grade of the gravel sought by a competent engineer, while not infallible is far preferable to hap-hazard prospecting which often uses up considerable money with unsatisfactory result. Prospecting, of course is necessary, but before much money is spent the services of a good mining engineer will be found to be a matter of practical economy. A prospecting shaft is rarely necessary where the conformation of the surface will not permit tunnel or drift prospecting from the face of the mountain, that depending greatly on the thickness of the overlying strata of earth and rock. The definite and regular work on a drift mine by shaft is a costly process, tunneling on an easy grade being in nine cases out of ten the cheapest and most satisfactory way. In this branch of mining the risks and expense are counted small when the yield is so great as in numerous familiar instances in California's mining history, where $10,000 was got from one carload of gravel, or where over $750,000 was secured from half an acre of rich ground.

It is probably no exaggeration of facts to say that for every dollar taken from the ancient river channels of California there remains ten to be added to the world's wealth by drift mining.

It may be considered as the unwritten law that if A and B agree to supply C with the needful supplies for prospecting, etc., anything discovered to be for the joint benefit of the three, any failure on the part of A and B to keep their part of the agreement absolves C from all claims by them, and he can discover and locate claims for himself, regardless of the contract.

Concentrates.

ALASKANS propose to establish a mining bureau.

DURING June $71,409.50 was paid to Comstock employes.

THE Mount Moriah mine, in Sierra county, is shut down for the present.

GOOD reports come from the Camp Floyd, Utah district, as a gold producer.

THE *Montana Mining Age* is a year old, and a good healthy child of its age.

THE Stewart mine at Bingham, Utah, is reported producing $25,000 per month in gold.

The Anaconda, Montana, *Review* announces that hereafter it will be "the A. R. U. organ."

THE New London mine near Plymouth, Amador Co., has been sold to a New York company.

A 250-foot tunnel is being run in the Crandall mine at Ophir, recently bonded by White and Thorpe.

THE Wasatch mine has been sold at Marshall's sale to the Ontario Company for $210,000.

A RECENT crushing of 99 loads of quartz from the Wisconsin mine, Grass Valley district, yielded over $2500.

THE Pioche, Nev., *Lode* says the last cleanup bar of gold bullion from the Condor mill is valued at $20,000.

THE total value of the gold, silver, coal and other minerals raised in New South Wales during 1893 was £104,280,711.

SEVERAL prospectors are reported to have been murdered by unmarauding Indians in the regions west of the Arrow lakes.

TWENTY-SIX men are employed at the Gwin mine, getting ready for the machinery which has been delayed by the tie-up.

THE mill at Bullionville, Nev., has been leased to Walter Reeder. Chloridizing and amalgamating tailings will be continued.

THE new canal near Colfax carries 1200 inches of water. The South Yuba Company is laying a system of water-works at Rocklin.

THE value of antimony produced in New South Wales during 1893 was £25,092, an increase of £10,412 compared with the previous year.

THE mines of the White Hills Company, near Kingman, Arizona, have been closed down. The mill will continue working till August 1st.

AT the Blue Lead gravel mine, at Relief Hill, the tunnel has been extended 200 feet. It is run by contract, and is now in over 2000 feet.

THE diamond fields at Bingera, in New South Wales, yielded during 1893, 15,000 carats, valued at £15,375, or an average of 20s. 6d. per carat.

THE DeLamar Gold Mining Company at Ferguson, Nev., have an improved artesian boring machine, with a boring capacity of 3000 feet.

THE Fisher Maiden lode, south of Four Mile in the Slocan, has been traced for three miles, making it the biggest ledge known in the district.

THE Ontario tunnel in Utah is a rival of the Sutro tunnel in Nevada. It is now in 15,000 feet, and has 560 feet more to go to reach its terminus.

THE old, old question of dip and apex is being argued in a $200,000 case at Provo, Utah, between the American Eagle Mining Co. and V. F. Clays.

THE Baker City, Or., *Democrat* says that the ore on the dump at the Emma mine, as experted by reliable mining men, will go from $100 to $300 to the ton.

E. H. COX has bought the Santa Rosa and the San Diego mines on Bear creek, Mariposa county, and has contracted for a tunnel 500 feet long to be run on them.

HYDRAULIC operations at the North Star have ceased. The Calaveras *Chronicle* is informed that it is the intention to work the mine by the drift process in future.

THE Vanderbilt *Shaft* says: "There has been little of special interest among the mines and prospects this week. The only question that interests us particularly is, 'How long will the grub hold out?'"

THE editor of the Tuolumne *Independent* had the pleasure last week of holding, for a few moments, a hundred ounce brick of gold, recently taken out of the Fairview pocket mine, situated north of Sonora.

REPORTS from Northern Idaho say silver properties are being abandoned on all sides, and the owners are turning their attention to gold. Everybody is looking for gold-bearing quartz and placer ground.

THE Gover mine has been started up. Alvinza Hayward, Superintendent Lane of the Utica mine and S. W. Cross, administrator of the Hobart estate, have bonded it, and expect to run the mine on a large scale.

THE Dardanelles mine, at Forest Hill, Cal., has closed down. Liens have been filed against the property for wages claimed. H. F. Calmberg, the former superintendent, is keeper under orders of the court.

THE Basin and Bay State Mining Co. has incorporated at Basin, Montana, with a paid up capital stock of $3,000,000. They own and will operate the Katie mine. A lawsuit with the Hope Company is on the program.

GILPIN COUNTY, COL., gold buyers, eager for traffic, are reported out and injured, paying $20.50 an ounce for placer gold that runs about $17 at the Mint, repeating the same experience of others at Oro Fino and elsewhere.

THE Rose Kimberly Mining Company has incorporated in San Francisco with a capital of $1,000,000, of which $2500 has been subscribed. Directors—George M. Spencer, J. H. L. Tuck, F. E. Montverde, A. J. Dewey, G. E. Beach.

WHILE cleaning the bedrock ditch and flume at the Hupp & McMurry mine last week, the Trinity *Journal* says three twenty-dollar gold pieces bearing date of 1856 were found. they had probably been buried by some miner in early days.

THE *Enterprise* says the old Ophir mill is about to be cleaned up. It will take several months to complete the work, and the men who have the contract will probably make a neat little sum for their labor, as the leakage of quicksilver and amalgam for years past has been left undisturbed in the ground under the mill. Some pretty rich ore from the Comstock was worked in this mill in years gone by, and a little bonanza is likely to be run into.

MALTMAN & TOMPSON of Nevada City are reported to have bought the sulphurets at the Pioneer quartz mine near Damascus. The nearest railway station is Towles, a distance of eight miles. The ore must be packed to that point by a mule train.

CONGRESSMAN CAMINETTI expects to get a bill through this session ordaining that in case of a mining entry being contested the Government Land Office shall assume the lands inclosed in a mineral belt are mineral lands till the contrary is proved.

THE railroad tie-up is productive of a good many items like the following from the Nevada *Transcript*, which sound singular in California in 1894: John F. Kidder left this afternoon, with Ed. Fitzsimmons as driver, for Sacramento, and will take the boat to-morrow for the bay.

THE Niagonda Gold Mining Co. has incorporated in this city with a capital stock of $250,000, of which about $1000 is subscribed. S. L. Lent, Abner Gorrish, J. C. Steele, E. W. Wooster, W. E. Bayer, J. A. Stark and W. M. English are the incorporators.

AT Cal. Clarke's mine near Nevada City they have set up a light hoisting rig, with a twelve-horse power engine, which serves for pumping and hoisting. A timbered incline pitches under the old shaft where twenty years ago ore was taken out going $110 to the ton.

A CHARLESTON correspondent of the Amador *Record* says a Government Debris Commissioner came up to Volcano recently and enjoined all the hydraulic miners in the vicinity, thereby throwing them out of positions whereby they were able to earn their daily bread.

THE Government engineers of the California Debris Commission have recommended to Congress the building of a series of dams and locks in the Yuba, Bear and American, the whole of which will cost about $1,000,000. The amount called for at De Guerre Point is $300,000.

THE *New Northwest* says there is considerable excitement over placer mining at Yogo. Bars that have been untouched for years are being sluiced off and money cleaned up daily. Quartz mining has been practically suspended and the attention of all is drawn to the placers.

FOR the fiscal year ending June 30, 1893, the value of deposits at the Denver assay office or branch mint, mostly gold, reached a total of $1,409,838.87. For the year ending June 30, 1894, the total was $3,240,624.45, of which $19,520.89 was silver, showing a gain in favor of the last fiscal year of $1,830,787.58—129 per cent.

THE *Record* says the new mining camp, located on Silver creek in Gilpin county, Colo., between Central City and Pine creek, is springing into favor with prospectors and miners very rapidly. Pay dirt is found at the surface; and though not of high grade, it is sufficiently rich to warrant systematic exploitation work.

G. L. SHELDON, superintendent of the Yellow Jacket mine, Ketchum, Idaho, says his company has placed orders for a 40-stamp mill, and as the machinery will have to be packed on mules for a distance of 50 miles, the mill will be built to conform to that animal's carrying capacity, and no piece will weigh over 350 pounds.

THE Montana Mining Company reports that there were 9738 ounces of gold and 95,855 ounces of silver produced in the six months ending with December, 1893, and figures the actual cost of producing the silver at 61.8 cents per ounce, which sold at 71.5 cents. At ruling figures there is no profit in the business so far as that mine is concerned.

ABOUT 1500 men are employed at the mine of the Anaconda Copper Company in Montana, and 1100 at the works. It is believed that, were no further developments made, there is enough ore now in sight to keep the smelters going for the remainder of this century. A slight rise in copper would enable the company to declare more good dividends for a number of years.

THE Bi-Metallic Company at Phillipsburg, Montana, is preparing to work the large pile of tailings accumulated at its mill. They have been assayed every 24 square feet, and upon careful investigation the company considers it a very profitable investment. The *Times* thinks should this venture prove profitable, it will keep the mill running for 18 months and produce $3,000,000.

SOME time ago, says the Kingman, Arizona, *Miner*, a cave in the Diamond Joe mine crushed the life out of a Mexican miner. An examination of the caved ground has revealed the presence of another ledge in the hanging wall that is said to be far richer than the vein in the old workings. The new discovery will be worked as soon as the ground in that vicinity is properly timbered.

THE number of men now employed at the Cripple Creek mines, not counting men who are working for themselves, count up 1236, which probably exceeds the number at work in any other district in the State. The heaviest force, 90 men, is employed at the Pike's Peak. The Cripple Creek *Journal* says that from 1500 to 1800 men are engaged in prospecting, leasing, ore hauling and milling.

THOS. TRESIZE wants the Blythe estate to pay him $14,089.29. The dead millionaire owned the Blue Jacket mine, in Elko county, Nevada, and Tresize says he was employed as keeper and watchman from October 18, 1879, to July 18, 1892, at $4 a day. He was paid $4,370.71 and wants $14,089.29 more for the 4615 days. From present reported value of the property, the estate may conclude to make him a present of the mine and call it square.

AT Clarke's Calusa, Montana, it is asserted that one of the shift bosses had been selling positions for $20 each, from which he has saved a comfortable stake. One of the men who bought a job was not giving satisfaction and was fired, when he made a big kick for the return of the $20. The management bearing of the marketable price of jobs and of their disposal at once dispensed with the underground employment agency by discharging the gentleman.

THE Morongo King Mining Company, of San Bernardino county, has bonded its property to a Chicago syndicate for ninety days for $325,000. The Chicago parties are to have possession of the property upon the payment down at any time within the ninety days of one-half the purchase price. The balance is to be paid in four equal payments in three, six, nine and twelve months. The purchasers are to turn over one-half of the gross output of the mine each month to apply on the deferred payments and retain one-half and pay all operating expenses. Until the payment of one-half the purchase price, the present owners will continue to operate the property for their own profit.

THE Calaveras *Chronicle* reports a rich pocket struck in the Moser mine, 155 feet from the surface. The extent of the pocket is not known, as only the ore was taken out that was encountered in sinking the shaft. There is a 62-pound piece of the ore now on exhibition in this place that experts say will yield $1000, while they have at the mine a number of smaller specimens that are equally as rich. This is the second rich spot that has been encountered since the work of development was commenced by the Roanoke Company, while all the rock taken out and put through the mill has a splendid average. Everything points to a second Utica.

Clipped and Condensed.

THE attendance at the San Francisco fair aggregated 2,300,000.

THE House and Senate are so far unable to agree on the tariff bill.

GREAT quantities of counterfeit silver coin are being circulated in San Francisco.

OVER 1,000,000 letters, besides tons of other mail matter, were received at the San Francisco postoffice last Sunday and Monday.

On Saturday Prest. Debs of the A. R. U. submitted a proposition for peace to the Chicago Board of Railway Managers, asking that all strikers unconvicted of crime be taken back to work without prejudice, to be recognized as individuals, irrespective of any organization. The proposition was rejected. The federated trades decided not to call a general walk-out. The announcement wired to this coast that the strike was off was denied. Two more men were shot by the regular troops at Sacramento, one fatally. At Los Angeles the strike was virtually over; in Oakland local trains resumed. Outside the State there was a general resumption of business. Sunday and Monday there were a few conflicts, the trend of events showing that the strike was virtually over. In Congress by a vote of 125 to 27 the President was endorsed in his action; Governors of States generally commended his two proclamations. At Los Angeles a bill in equity was filed under direction of deputy Attorney-General Denis against the Southern Pacific in the United States Circuit Court, asking that the combination of other corporations with that company be dissolved, alleging that the present combination of thirty-five railway companies in this State is a conspiracy to retard and restrict commerce. If the Government wins, it means that the Central Pacific of California, the Southern Pacific of Arizona and of New Mexico, the Santa Monica branch, the Long Beach branch, and in fact all the lines which go to make up the Southern Pacific system will be separated and operated by their own set of officers. Olney says the Los Angeles U. S. official has exceeded his instructions in the matter. At Sacramento Knox and Worden were arrested charged with murder and sent to the Yolo county jail. At Chicago, on Tuesday, Debs and associates refused proffered bail and were taken to jail. Throughout the Union there were various railway accidents caused by the strike and several collisions between those who said the trains should run and those who said they shouldn't, none resulting fatally, the principal battles being in Pennsylvania and Indiana. In Chicago, the storm center of it all, trains were running and general business went on. Near Missoula, Montana, a Northern Pacific engine was wrecked by twenty pounds of dynamite exploding on the track and fired with a railroad torpedo. U. S. regulars were started from Omaha to Butte; at Sacramento, General Superintendent Fillmore of the Southern Pacific Railway met the mediation committee of the A. R. U. and offered to take all the strikers back in the company's employ if the movement of Pullman cars was not interfered with; at the subsequent meeting the strikers refused to discuss the proposition. In the southern part of the State all trains were running regularly. Train service to and from Oakland was resumed, an attempt being made to blow up one local train in Oakland resulting in temporarily disabling the engine. On Wednesday, from his jail, Debs ordered a tie-up in the Chicago stock yards which was only partially observed, the chief result being incendiarism and general lawlessness. Some of the Pullman strikers returned to work. At Sacramento and all other points in this State trains moved freely. Throughout the Northwest everything was reported quiet. On Friday T. J. Roberts, who represents the A. R. U. in this section, denied the rumor that president Debs had declared the strike off.

Personal.

JOHN ST. CHARLES is the new foreman of the Tennessee mine, near Kingman, Arizona.

C. HEGGARTY of Moore's Flat has some fine specimens of quartz gold now on exhibition.

D. A. MACDONALD is now superintending the Pactolian mine at Hurleton, Butte county.

CHARLES E. UREN, county surveyor of Nevada county, is making a survey of the South Spring Hill mine.

MR. ALFRED JAMES of Glasgow, Scotland, representing the Cassel Gold Extracting Co., is visiting this State.

L. P. GOLDSTONE has resigned the superintendency of the Osborn Hill mine, and will in future devote his attention to the Merrimac.

CAPT. RODDA, former superintendent of the Phœnix mine and mill at Hurleton, now has charge of the Banner mine and mill, near Oregon City, Butte county.

PATRICK KANE, for many years superintendent of the Anaconda and St. Lawrence mines at Butte, at what is believed to be the highest salary of any mining superintendent in the country, has resigned on account of failing health.

CAPT. JOHN CARTER, for many years the foreman of the Idaho mine, and subsequently the boss timberman for the Maryland mine at Grass Valley, has resigned his position, having some mining ventures of his own which claim his attention.

Notes on the Gold Ores of California.

H. W. Turner in the *American Journal of Science*, June, 1894.

As is well known, gold occurs chiefly in quartz veins and these in California have been found to be the largest and richest in the slate series of the Sierra Nevada, but gold occurs in a great variety of rocks and associated with very different minerals.

The occurrences will be grouped geographically.

Veins in the Auriferous Slate Series.—Most of the richest gold mines of California occur in the auriferous slates, and in the associated greenstone slates which are, to a considerable extent, metamorphie forms of diabases and porphyrites. The richest single belt of mines is that along the mother lode, which consists of a series of quartz veins chiefly in a belt of elay slates of Jnrassic age, which are designated on the maps of the United States Geological Survey as the "Mariposa slates." The quartz veins are not, however, entirely in these clay slates. In the southern part of Calaveras county and in part of Tuolumne county, the lode lies to the east of this clay slate helt, chiefly in amphiholite-schists. At many points, as at Carson hill in Calaveras county and at Qnartz monntain in Tuolumne county, the quartz masses are very large. At other points the quartz occurs in little veins and stringers, through a mineralized zone of the black slate, which then forms part of the vein. In some snch occurrences the iron sulphurets containing gold are found both in the slate and in the quartz, and all the material is treated as ore.

Accompanying the mother lode quartz veins at many points is a green micaceons mineral, containing chromium and called mariposite by Silliman, who states that, so far as he observed, this mineral accompanied the quartz veins only in the neighborhood of magnesian and chloritic rocks.

Prof. Silliman also states that the white magnesian mineral associated with the mariposite is ankerite. Other minerals fouud by the same author along the mother lode are ordinary iron and copper sulphides, antimonial copper sulphides, antimonial lead sulphides, and various tellnrides. Prof. Silliman also identified somewhat doubtfully tetrahedrite or gray copper ore at the Rawhide mine in Tuolumne county.

Prof. F. A. Genth states that pctzite, telluride of gold and silver, calaverite, telluride of gold; altaite, telluride of lead, aud melonite, tclluride of nickel, occnr at various mines of the mother lode in the area of the Stanislaus drainage.

Prof. W. P. Blake states that blende and tetrahedrite are found at Carson hill, and in the Pine Tree mine in Mariposa county. The latter mine directly adjoins the Josephine.

Associated with mariposite at the Josephine mine in Mariposa connty, and at Qnartz momtain in Tuolumne county, is a white mineral which at some points appears to form veins in the mariposite. This is probably the mineral called ankerite by Silliman. An examination of this material by Dr. Hillebrand shows that it is ordinary dolomite mixed with quartz and not ankerite. In the Josephine mine erythrite, a dydrous arsenate of cobalt, forms on surfaces and in seams of the rock adjoining the vein.

In addition to the ordinary iron sulphurets, the writer has observed in the mother-lode ores in Amador county, galena, bleude, and arsenical sulphurets in small amounts. As a general rnle the ore of the large mines of the mother lode shows no free gold and only iron sulphurets. Specimens showing free gold and other than iron sulphides are not abnndant. All of the mother-lode ores would be called free milling.

In the Paleozoic schists to the east of the mother lode there are numerous gold veins which have been worked with varying success. One of the most profitable of this group of miues is the Sheep Ranch mine of Calaveras county. The conntry rock of this mine is a mica-schist. The mines about Summersville in Tuolumne county are also in mica-schist. In these mines likewise the snlphurets do not exist as a rule in large amount and the ores may he classed as free milling. One of the most interesting of the mines of this group is the Blue Wiug vein of the Willard Mining Company, north of Murphy's, Calaveras county. Here in limestone is a quartz vein which in places is accompanied by brown-vein jasper. In the Blue Wing vein are found the snlphides of mercury, antimony and lead. Bird's-eye porphyry, in this case probably an altered diorite, cuts the limestone in dikes. In the highly altered slates aud ernptive rocks to the west of Blue mountain in Calaveras county are a group of mines, the ores of which are very basic. Sulphides containing lead, silver, zinc, arsenic and iron are fouud in the ore. At the Bonanza minc at Sonora, in Tuolumne county, the ore occurs in pockets along a diorite dike in the slates. Large masses of free gold with tellurides oceur here and iron and copper snlphides.

At the Ilex mine in Calaveras county, in Paleozoic mica-chlorite-schist, there is a large qnartz vein having a eonrse N. 80 deg. E. Tetrahedrite and snlphides of lead, zinc and copper, as well as free gold, are found sparingly in the ore.

Forming the crest of the Sierra Nevada to the east of Yosemite valley is a belt of schists of unknowu age. Mt. Dana and Mt. Lyell are culminating points of this area of schists, which extends at least 12 miles northwest of Mt. Dana, and, judging from the reports of the State Mineralogist, at least as far south as the Minarets. This schist belt contains deposits of hase ores at numerous points. Specimens obtained by the writer from the Tioga district, to the northwest of Mt. Dana, and from Mono pass, show that the bulk of the ores are very rich in sulphides and would probably be difficult of reduction. These ores contain gold and silver, cobaltite, and sulphides of antimony, lead, zinc, copper and iron. One specimen of quartz from the Tioga mine shows a notable quantity of pyrrhotite.

The report of Mr. E. B. Preston on the silver ores of the Minarets miuing district indicates that the ores are very similar to those above described.

At Mineral King, abont 15 miles southwest of Mt. Whitney, is a hody of Triassic schists enelosed in the granite and containing some gold-qnartz veins. At the npper workings of the Empire mine there is a small quartz vein in crystalline limestone.

Blende and galena occur in the limestone and blende in the quartz. The mines at Mineral King have not proved profitahle, hut the district ahout Tioga and Lundy is a promising one.

Veins in the Granite.—The greater portion of the higher part of the Sierra Nevada and nearly the entire mass of it to the south of Mariposa county is composed of granite. In this large granite area very few auriferous quartz veins have been found. In many of the smaller areas, however, entirely or partly enclosed in the auriferous slate series, there are numerous veins frequently containing ahnndant gold. Two of these enclosed granite areas have been extensively exploited, that about West Point in Calaveras county and ahont Soulshyville in Tehama county.

In a general way the ores of the granite districts are very hase, and need chlorination to ohtain the gold, but this rule is by no means universal.

The ores of the mines of the Soulshyville district in many cases contain a galena-like mineral which gives blowpipe reactions for lead and antimony. Copper and iron sulphurets, magnetic iron pyrite or pyrrhotite, and blende are ahnndant. The vein of the Black Oak quartz mine is accompanied by a dark, fine-grained, slaty rock called "slate" by the miners. This in thin section is seen to contain a large amount of fibrous green hornhlende in ragged prisms lying at all angles and in radiating tufts, and is presumably an altered dike rock, perhaps a fiue-grained diorite. There is also a fine-grained dike (?) rock next to the vein of the Platt and Gilsen mine, which contains a good deal of a brownish mica, specks of iron bisulphide and cblorite in minute veins. This rock is also called "slate" by the miners. The ore of the Hyde mine, which is also in granite in the Soulsbyville district, is free milling. It contains the same sulphurets as the other mines above mentioned, but in smaller amount.

In the West Point mining district the orc contains abundant ordinary iron aud copper sulphides and magnetic iron pyrite or pyrrhotite. Cutting the vein of the Lockwood mine are dikes of a fine-grained diorite of the camptonite series. The vein was said to have been richer where cut hy these dikes.

To the north of Merrimac, in Butte county, similar dikes accompany some of the gold-qnartz veins in the grauitc.

Gold in Albite.—As is well known, free gold usually occurs associated with quartz as a gangue. Instauces are on record, however, of its occurrence in various materials, as talc, calcite, etc. Reeently a series of specimens was sent to the writer by Mr. Leo Von Rosenberg of New York City, from the Shaw mine in El Dorado county, about four miles southwest of Placerville. This deposit occurs in clay sheets associated with a dike or dikes of a feldspathic rock, which appears to he devoid of bisilicates. Judging from the specimens forwarded, the dike rock is more or less decomposed, and is at some points replaced by secondary white feldspar, which at other points cuts the dike rock in little seams. This feldspar is well crystallized, and with the aid of a lens, striations may be noted on the crystals. In thin section these feldspars are seen to he twinned polysynthetically, with extinctious proper to albite, aud a partial chemical analysis by Dr. Hillebrand of the U. S. Geological Snrvey shows that it contains soda, no lime, and abont 19 per cent of alumina. It is therefore albite. In two specimens of this crystallized albite there is free gold. Another interesting specimen is of a dark, fine-grained rock which appears to be an aphantic form of the dike rock, in a seam of which free gold with a little calcite has been deposited.

The following is a partial analysis by George Steiger of the feldspar of the grayish-greeu dike rock forming part of the Shaw mine lode:

(No. 452, Sierra Nevada collection.)

Alumina	about 20.00
Lime	.49
Potassa	1.15
Soda	8.72

This would indicate that the feldspar of the dike rock is also albite, although not so pure as the seeondary albite that oceurs in the veins cutting the dike rock.

The feldspathie lode of the Shaw mine is cut by little veins of quartz, but judging from the specimens sent, these are not very ahundant and do not seem to he connected with the deposition of the gold.

The quartz veins cut the veins of secondary albite, showing that they were formed later than the albite. In one specimen there seemed to be an intermingling of quartz aud albite, pointing to contemporaneons deposition. But in thin section the idiomorphic albite crystals were plainly seen to he euclosed in the quartz, as if there had been a little fissure, the walls of which were coated with albite crystals and the open spaces in the middle hetween the albite crystals later filled in with quartz. All of the material of the lode, except perhaps the quartz, contains iron disnlphide scattered through it in minute cubes, and calcite in little rhomhs and partieles.

Oro Fino Gold Mine.—One and a half miles northeast of Mt. Aigare, in El Dorado county, on the west side of Big Canyon creek, is a dike of rock ahout 1500 feet long, with a nearly north and south strike, but curving to the southwest at the south end. This dike is much broken up, and recemented into a breccia. One of the specimens of the dike, collected there by the writer in 1889, is a quartz-diorite, containing specks of iron disulphide and calcite; another specimen whieh seemed to grade over into the diorite is composed of a plagioclase feldspar, prohahly albite, calcite and grains of iron disnlphide, and strongly resembles in thin section the vein material of the Shaw mine. This last specimen has a brecciated strncture. It is auriferons and is the ore of the mine known as the Oro Fino gold mine. The country rock of the mine is elay slate, the same belt as at the Shaw mine, and is prohably Carboniferous in age.

The gold deposits of both the Shaw and the Oro Fino mines are of snch an unusnal uature as to deserve further investigation.

Petre's River Mine.—One mile northwest of the town of Mokelumne Hill, in Calaveras county, on the north bank of the Mokelumne river, is a quartz mine, owned by Mr. R. W. Petre. There are here two quartz veins which have a northwesterly strike and dip southwesterly abont 80 degrees. The veins are very irregnlar in width, opening out into lens-shaped bodies and quickly pinching ont again. Mr. Petre stated that one of these lenses contained $10,000 in gold, but that most of the qnartz was of low grade. The country rock of the mine is a quartz-diorite. Some granite schistose material occnrs along the main veins. A microscopic examination of this shows that it is practically a chlorite-schist. It is composed of a schistose aggregate of minnte grains of feldspar, with much chlorite and calcite. This schist is doubtless an attrition product, formed by movement along the walls of the vein. In one part of the vein there is a good deal of a hard white material, which the microscope shows to be largely feldspar, presumably albite. The feldspar ocenrs in nnstriated interlocking grains, with occasional twinned prisms. There is a good deal of calcite, pyrite and muscovite, and foils of a green chloritie mineral. In the quartz-diorite country rock near the vein are a nnmber of rounded bodies of calcite, some three feet in diameter. This calcite was donbtless deposited in pre-existing cavities.

Gold with Barite.—Mr. W. Lindgren has described an interesting deposit at Pine Hill, Cal. In a zone of decomposed and kaolinized diabase are irregular veins or seams of harite with which gold is associated. Other similar associations are noted.

Mr. Wirt Tassin of the U. S. National Mnseum kindly called my attention to a paper by Henry Louis, on the mode of occnrreuce of gold. Mr. Louis gives a list of 77 species of mincrals, some of which, however, are formed from the decomposition of previously existing minerals that are found in gold veins. Only one feldspar is noted—orthoelase from Colorado. The exact locality is not given. The anthor further says that while iron pyrite is an almost universal constitnent of gold quartz veins, marcasite seems never to occur; and in conclnsion suggests that the gold and qnartz have been simnltaneously deposited in veins from alkaline solutions.

Gold in Calcite.—The Yellowstone mine at Bear valley, Mariposa county, is in diabase. The eourse of the vein is abont W. 20 deg. S. The ore occurs in the altered diabase brokeu up along the vein and recemented with qnartz aud calcite. A specimeu of the ore presented by the superintendent, Mr. McDonald, to the Natioual Museum, shows spots of free gold at numerous points, associated with white quartz and calcite. According to Mr. Hall, the former owner, in the upper workings a good deal of the gold occnrred in calcite.

In the collection of the U. S. National Museum there is a specimen of ealcite in which arc threads of native gold. This was collected hy Dr. W. H. Melville, from the Baunock mine, Montana.

Gold with Quartz in Rhyolite.—One mile east of Onion valley, in Plumas county, Cal., is a dike of rhyolite in the auriferous slate series at the headwaters of Poorman creek, in a decomposed portion of which free gold occurs, associated with little veins of qnartz. As the gulch was very rich below this dike, it is possible that much of it came from the rhyolite. The occnrrence is remarkable inasmuch as the rhyolite is probahly of Tertiary age. This rhyolite is a white rock with abundant foils of a brown mica, and phenocrysts of sanadine and plagioclase

with a few rounded quartzes in a microcrystalline ground mass.

Gold with Cinnabar.—Besides the Blue Wing vein locality previously noted, gold occurs with cinnabar in a vein in diabase, near Coulterville. The cinnabar is in large fine crystals. The mine is the property of C. L. Mast, and is the one referred to by Becker.

Free gold is found with cinnabar in the Manzanita mine, in Colusa county, in the Coast Range, in metamorphosed strata containing *Aucella piochi*, Gabb—a fossil characteristic of the lowest Cretaceous.

The Coming Metal.

A window on Market street, in this city, has a constant crowd of people in front of it. It is full of articles of domestic use made of aluminum. Cups, kettles, pans, dishes, trays, spoons, and a hundred other articles are exhibited made of the bright, light metal.

For years, ever since 1827, men have known that there was such a metal as aluminum. A scientist named Wohler, who experimented upon earths with electricity, discovered several metals unknown previously. Among them was calcium, which costs $300 an ounce, on account of the difficulty of separating it, although every human skeleton contains about $1800 worth of it. But of all these metals aluminum is the white queen. It has a number of wonderful qualities which make it very valuable, and nature, when her time is ripe, evidently intends that it shall be the most useful agent known, as she has created it more abundantly than any other metal. It forms almost half the substance of the surface of the earth. Every clay bank is full of it, and all rocks are beds of it.

Thus far it has been possible to take aluminum out of only two substances—"cryolite," a mineral found in Greenland, and "bauxite," another mineral lately discovered in Georgia and Alabama. In 1883 there were 33 pounds of aluminum produced in the United States; in 1892 we used 260,000 pounds, and 10 years hence we shall doubtless use more than as many millions. When the aluminum cap was put on the Washington monument, in 1885, the metal cost $8 a pound; now it can be bought for 67 cents a pound. One of its peculiarities is its lightness. A solid block of it, one foot square, only weighs a pound. It does not tarnish, and acids have no effect upon it. This makes it very valuable for surgical instruments and for the wires which are used in sewing up wounds. The racing men are putting aluminum shoes upon all racehorses. Not only are they very light, but they preserve the feet of the horse. The rowers, who are always looking for new boats, have had racing shells built of the new metal. They can be made of single sheets one-nineteenth of an inch thick.

Sheets of it are also used for roofing houses. It does not have to be painted like tin, as rust and dampness will have no effect upon it. For this reason it is very valuable in cooking utensils, and furthermore, added to its extreme lightness, it has a great capacity for holding heat, and is also unbreakable. The armies of Europe have begun to see that aluminum will be very valuable for use in war. Even now they are using it wherever a metal may be used about the uniforms. It is as strong as iron and as light as chalk.

Aluminum has qualities which go beyond imagination. By mixing it with gold a beautiful ruby-tinted metal is produced, which can be used in decoration. Violins and guitars are being made of it, as it has wonderful tone vibrations. The ornamental work on the Transportation building at the Word's Fair was on a foundation of aluminum foil. The Diana on the Madison Square Garden tower, in New York, is made of it. But the greatest revolution it is destined to bring about will take place in the air. At last a substance has been discovered which seems to make a flying machine a possibility.

A Big Gold Seizure.

Says a Nogales, Arizona, dispatch of the 15th:

The most valuable seizure ever made by the Customs Service here was a haul made to-day by the force on the Mexican side. A Mexican from Hermosillo named Noriega is now minus $12,000 in gold dust from the Altar diggings of Sonora. The Mexican had the gold in his satchel, 623 ounces, and alighted from the back end of the train and attempted to dodge off and make away with it to the American side.

A rurale having been warned, the officer was on the lookout for him, and demanded an examination of the traveler's satchel. The Mexican said it was all right, but that availed nothing. The valise was taken from the boy carrying it and opened. There was 40 pounds of gold.

Noriega was seized and is now in jail and liable to five years in a Mexican prison. His chance to escape imprisonment is to "renounce" the gold, declaring it is the property of another, which he will probably do. It is suspected he did not own the gold, but was actually conveying it for others, and that he will come in for a share of the seizure. The rurale who made the arrest will get half of the seizure. In Mexico the export duty is ten per cent "mintage" on uncoined gold taken from the country.

In an Arsenic Mine.

Many points of interest are brought out in a description in a technical journal of the way in which arsenic is obtained from one of the most famous mines in England, the Devon Great Consuls. The mine was originally worked for copper alone, and would have been abandoned but for the discovery that the waste thrown out as worthless when copper was sought proved rich in arsenic. Although copper is still raised, it is in small quantities, and the mine has been resolved into an arsenic works. The arsenical pyrites consist of 25 to 30 per cent of iron, 12½ to 14 per cent of arsenic and the rest of earthy matter. After being crushed this is sorted by girls of from 13 to 16 years of age. It is then washed and "jigged" or sifted and passed on to the first calciner, where it is burned with low-classed coal and produces "arsenic soot"—that is, arsenic so mixed with smoke from the coal as to be a gray color.

The arsenic and soot, deposited in combination in the chimney or condenser, are scraped out and taken to the second calciner for purification. The calciners consist of revolving iron drums, through which a fire of anthracite coal is carried on rotating iron furnaces kept red-hot. As the arsenical soot is subjected to the influence of this heat the arsenic is sublimed and condensed. This operation has to be carefully watched, and if the workmen burn the arsenic badly they have to pay for it.

The arsenic is liable to produce sores if permitted to lodge in wrinkles and folds of the flesh, or about the mouth and nostrils. As a rule, however, this only happens when there is carelessness as to personal cleanliness, and the arsenic workers simply have to wash themselves thoroughly every day on returning from work. Otherwise the work is considered healthy. It prevents all eczema, and the fumes of sulphuric acid, as well as the arsenical dust, are fatal to germs of the disease. Most workmen remain at the works for a number of years without suffering, but occasionally the symptoms of arseuical poison, loss of appetite, nausea, frontal headache and anæmia declare themselves. The greatest danger to which the workmen are exposed is met with when it is necessary for any purpose to enter the upright shaft. The effect on the eyes is most painful, and a further curious evidence of the virulence of the pervading atmosphere becomes manifest. The men wear linen garments lined with flannel, and the sulphuric acid fumes completely destroy the linen in a few moments, leaving the flannel intact, so that the men go into the shaft in linen and come out clad in wool. Fortunately it is seldom necessary to enter the shaft, or a great loss of sight would ensue.

King Mining Company.

Col. M. D. Biege, of Chicago, secretary and general manager, and Capt. H. H. Henshaw, vice president of the King Mining Company, are here looking after the company's interests, says the Pony, Montana, *Monitor*. They have closed the contract with Redfield & Mercer to construct a ditch some three miles long for water power. The water is taken from the Big Hole river, and will end on the bench about 80 rods north of the bridge crossing the Big Hole river.

The company's reduction mills, 25-ton capacity, will be erected on the west bank of the Big Hole river, north of the bridge. The water from the ditch will be flumed to the mill, giving a fall of about 40 feet. It will be the best water power and mill site in this part of the State. The machinery for the mill is now in transit, and lumber will soon be on the ground for the mill. It is expected that the ditch and mill will be finished within 60 days and in running order. W. C. Blinn, of Rockford, Ill., will build the mill.

The company is now working a force of miners in the King mine and stoping from the 80-foot level. They have about 150 tons of ore on the dump. Since commencing work from the 80-foot level, about two weeks ago, they have taken out about 50 tons of fine ore. The colonel sent samples of this ore to Butte last week to be assayed, giving an average of the dump, which runs $83.70 per ton—$73.60 in gold and $10.10 in silver. They estimate that there is in sight and available about $2000 tons, which will be extracted and put on the dump for the mill when completed.

The officers of the company feel greatly encouraged over the outlook, and hope in the near future to have their mill in operation, which will be of incalculable value to this section of our State. The gentlemen representing the company are all energetic men and mean business. We welcome them and wish them every success possible. The western office of the company is located here at Twin Bridges, and their reduction mills will be one and a half miles from here.

Cyanide Process in New Zealand.

At the Waihi mine, Karangahake, all the ore is now being treated by the cyanide process. The plant is the largest of its kind in the Australasian colonies—though it is likely to be eclipsed by that now in course of erection at Croydon (Q.)—and it is said to be working in the most satisfactory manner. The *Mining Standard* says there are 13 large vats in operation, and the monthly bullion returns are likely to be considerably higher than formerly. For the 28 days ending May 5th, 1633 tons of ore were treated and crushed for a return of bullion valued at £4493.

Information to hand relative to the treatment of the tailings purchased by the Cassel Company from the Waihi G. M. Company, states that for the month ending May 5th, 2072 ounces of gold, valued at £2644 16s 4d, were extracted from 1920 tons of tailings. This is an eminently satisfactory return.

The New Zealand Crown Mines Company, Karangahake, has been successful in obtaining during the past month from 480 tons a bullion return of £1130.

Excellent progress is being made by the contractors who are fitting up the plant for the Cassel process at the Golden Cross mine in the Waitekauri district. It is expected that everything will be completed in about a month's time.

The Grace Darling Company have accepted a tender for the erection of a new reduction plant, the contract price being £2700. The plant will comprise a 10-head of heavy American stampers, besides the necessary appliances for the use of the cyanide process in connection with the same.

In the Kuaotunu district the Try Fluke Company have lately acquired the Mariposa ground and set men to work there. They have erected an additional five stamps in the battery, and will have no difficulty in keeping it going; and, having obtained the Mariposa ground, they may find it necessary to erect even more stampers. They now hold a large area of country, and will practically have an unlimited supply of crushing material for years to come. The Kapai-Vermont machinery has arrived on the ground and good progress is being made with its erection. It consists of an Otis pulverizer. The stuff will be crushed dry and fed in cyanide vats. The working of this machine will be watched with great interest, as it is the first of the kind in this district. The mine itself is looking remarkably well, and ought to give a good account of itself when working.

The Telephone Dead Beat.

"If there is a variety of dead beats," said an eminent citizen this morning, "which annoys me more than all others, it is the man who moves into your building because you have a telephone. At first he drops into your office and tells you his wife bade him order a steak before noon, and that he had forgotten whether it was porterhouse or sirloin. He says that a family across the street from his house has a 'phone, and with your permission he'll just ring 'em up and have 'em send for Mrs. X. Well, that doesn't bother you much because you are thinking of the family across the street, but in a week or two Mrs. X. begins to call you up with the request to step across the hall and bring her husband to the 'phone. Then the husband begins to drop in to telephone his commercial acquaintances till two-thirds of his entire business is done over your wire. There is only one more step. One of his agents is up, say in Mount Morris, and it is very necessary to communicate with him immediately. As much as $4 may depend upon a word. He hurries in and says of course you have connected with Mount Morris. It is marvelous how man's inventions put the miles at naught.

"While you are chalking up 25 cents to profit and loss, he has become the possessor of your telephone. From that time on, if you are using it when he comes in, he waits impatiently and gives you a look when you ring off as much as to say: 'Sir, you are taking liberties with my property which I must resent.' There are but two things left to do—take out the telephone or move out yourself. I am fond of my offices, so the telephone had to go."—Rochester Standard-Union.

To Raise the Drowned.

An effective method of raising the drowned is given us by a gentleman of experience, as follows: Take a half gallon fruit jar, fill it half full of unslacked lime, then put on the rubber and screw the metal top perfectly air tight. Perforate the top with small holes, attach a weight and sink the jar in the locality where the body of the drowned person is supposed to be. As the water seeps into the jar the lime gradually becomes slacked and generates a gas which in ten minutes' time will cause an explosion with the force of dynamite, raising every object to the surface within a radius of 50 feet. Those who have seen the operation say it has never failed to bring the desired results.

Figuring Out a Profit.

The following is from the Silver City, New Mexico, *Enterprise*. It shows how sanguine many men, including newspaper men, are, and how easy it is to figure out big profits—on paper.

Talking of the Confidence mine at Mogollons, the *Enterprise* says:

One adit level has been driven upon the vein for a distance of 1300 feet, which attains a depth of 420 feet. Air shafts have been sunk at intervals to intersect the tunnel, and they also serve as means of development and blocking out the ore bodies. The ore bodies extend throughout nearly the whole length of the adit level with but short intervals of low-grade ground between the ore chutes. The ore bodies average fully five feet in width, and the average grade is about $15 in gold and 30 ounces in silver. There is also a winze sunk from the bottom of the level to a depth of 80 feet, which shows five feet of higher grade ore than the above, running about $18 in gold and 36 ounces in silver. Leaving out all the ore exposed in the bottom of the level, and also that developed by the winze below the level, and making an allowance of 300 feet for barren or low-grade ore between the main ore chutes, which is more than the barren ground covers, we would have 1000 feet in length multiplied by 300 feet average height above tunnel by 5 feet average width of one body would give the number of cubic feet of ore developed and blocked out ready for extraction as 1,500,000 cubic feet. At 12 cubic feet per ton of ore, we have 125,000 tons in sight, which, countiug very conservatively, an average of $25 per ton saved in the mill would give $3,125,000. Under any reasonable hypothesis the ore bodies can be safely estimated to go as deep as already explored by the winze—say 100 feet below the adit level. This additional depth would add $1,040,000 to the above calculations, making a total of $4,165,000 absolutely to be depended upon. The cost of extraction cannot possibly exceed $2 per ton on these ore bodies now developed. It is understood an offer has been made to contract for the hauling to the mill at $1 per ton, while the milling will not cost to exceed $7 per ton at the outside limit. Allowing ten per cent of the proceeds, or $2.50 per ton, amounting to $416,500, to be expended in further development and for incidental expenses, there would then be left a net profit of 50 per cent or $2,082,500 on the ore in sight in the mine.

A Big South African Mine.

The Robinson Gold Mining Company in the Transvaal last year ran 60 stamps and crushed 94,842 tons of ore, which had an average value of £3 10s per ton. It derived about 79 per cent of its production from the ore worked in the mill, 8 per cent from concentrates by chlorination, and 13 per cent from the reworking of tailings by the cyanide process. The latter yielded a fair profit, though the extraction was only 68.7 per cent of the assay value, a proportion which the company hopes to increase. It is to be noted, says the *Mining Standard*, that in this mine, which has the deepest workings of any on the Witwatersrand, the proportion of pyritic to free-milling ore is increasing rapidly with depth, and the time is within view when the free-milling ore will entirely disappear. This can hardly be a pleasant outlook for those Witwatersrand companies which have based their expectations on a continuance of free gold and cheaply worked ores in the deep levels on the main reef, of which so much has been said. The Robinson is providing for the future and expects to extend the concentrating plant and the use of the chlorination process, as well as that of cyanide on the mill tailings. Like all the Transvaal companies the Robinson relies chiefly upon native labor; but does not find it altogether profitable or reliable. At present, however, it is a necessity, and will probably continue so for a long time to come.

Gold-Milling at the North Star Mine, Grass Valley, Cal.

(*Continued from page 33.*)

plates and shaking-table plates combined. The grade of these new plates is approximately uniform at 1½ inches to the foot. In Fig. 6, on this page, these improved plates (which cannot be too highly recommended) are shown in plan and elevation. The result of this introduction by the writer has strengthened the desire to remove the narrow sluices still remaining.

The lower illustration on page 33 shows the old and new plates, in the immediate foreground, to the left and right respectively.

Two-thirds of all the gold recovered by amalgamation is found in the batteries. The yield is, however, variable, frequently reaching 75 per cent. Of the amount recovered from the outside plates, the battery and apron-plates will produce 70 per cent, the sluice-plates 23 per cent, and the shaking-tables 7 per cent. The average value of amalgam from all sources is about $7.25 per ounce, the fineness of the gold bars is 856.

The batteries are cleaned up fortnightly; the outside copper plates, every other day, frequently daily, and, on rare occasions, morning and evening.

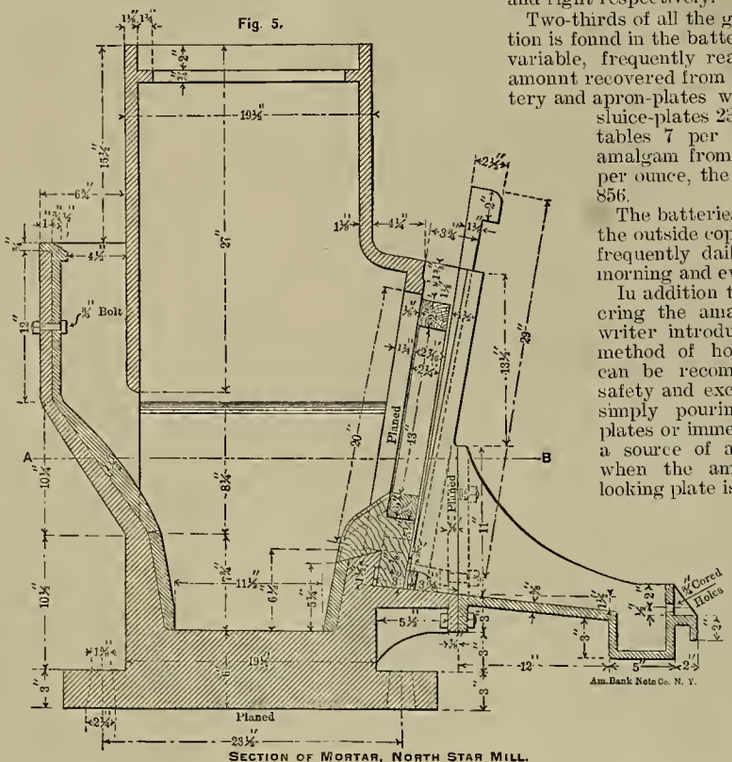
In addition to the usual method of recovering the amalgam from the plates, the writer introduced, several years ago, the method of hot-water "sweating," which can be recommended for its simplicity, safety and excellent results. The effect of simply pouring boiling water upon the plates or immersing them (on the apron), is a source of as much pleasure as surprise when the amount secured from a poor-looking plate is weighed. Notwithstanding previous sweatings during the year, the December or annual sweating at the North Star mill produced 1703 ounces amalgam from which 600 ounces gold was obtained, valued at $10,524.82.

Leaving the battery-floor, the pulp is conveyed through three-inch pipes to the concentrators on the floor below. Each battery of five stamps being provided with two machines, the full complement consists of twelve Triumph and four Frue vanners. The latter machines are preferred, and were introduced when the ten original stamps were installed. The machines are conveniently arranged on one floor and readily overlooked by one man on each shift. The appearance of the concentrator-floor is presented in the upper illustration on page 33.

The ore crushed at the North Star mill contains about four per cent of "sulphurets." Their average value is $53.58 per ton; and they have yielded in seven years a total product of $236,756.63. The concentrates are sold to the local chlorination works.

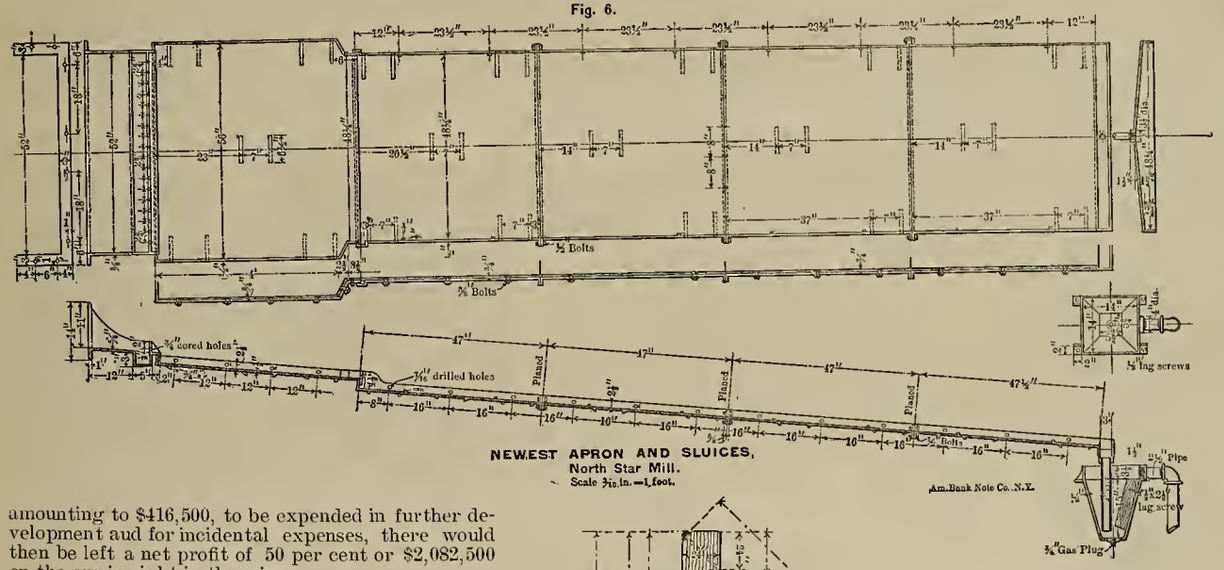
From the concentrating machines the pulp escapes as tailings, containing more

Fig. 5.



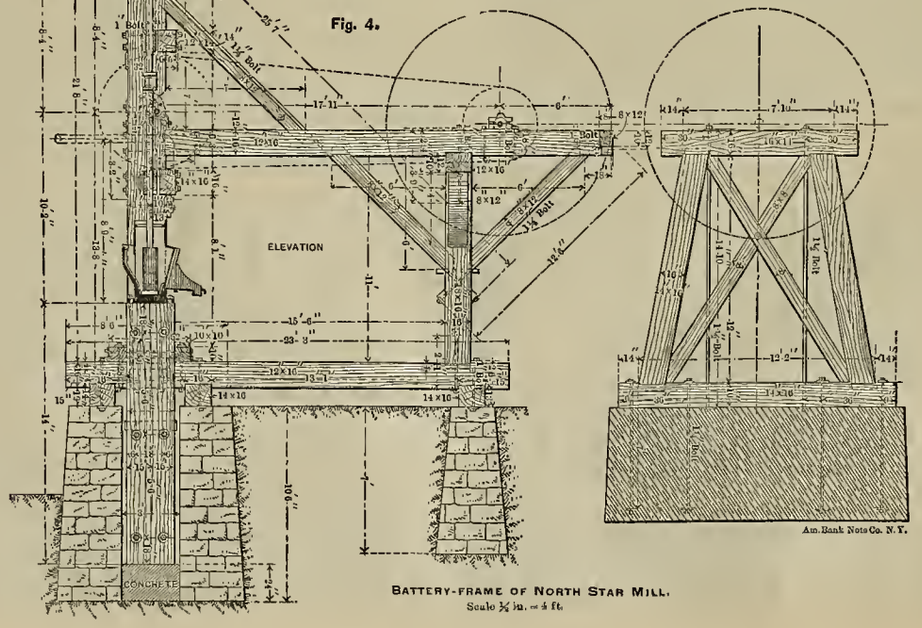
SECTION OF MORTAR, NORTH STAR MILL.
Scale 1 in. = 1 ft.

Fig. 6.



NEWEST APRON AND SLUICES,
North Star Mill.
Scale ½ in. = 1 foot.

Fig. 4.



BATTERY-FRAME OF NORTH STAR MILL.
Scale ½ in. = 1 ft.

or less gold, notwithstauding a high percentage saved of the ore value (reaching 94 per cent under favorable conditions). At the present writing, there is in operation a simplex rotary amalgamator, treating 10 tons of tailings per 24 hours. Results obtained thus far have redneed the loss in the tailings 22 cents per ton.

The mill is operated entirely by water power and notwithstanding a high rate per available horse power, the cost of power per ton of ore crushed has not exceeded $0.32. The water used has previously been utilized by the Original Empire Mill and Mining Company nnder a head of 450 feet. At the North Star, the effective head is 275 feet at the mill.

In conclusion, to accompany the foregoing description, the following tables have been prepared, giving details of the cost of milling at the North Star, extending over several years. During this period the average value of the ore crushed has been very high; and for the year jnst concluded a gross production of $335,757.04 has been attained.

ANNUAL TABULATED COST OF MILLING AT THE NORTH STAR MINE.

Table I. Year.	Supplies. Shoes.	Dies.	Quicksilver.	Screens.	Mill Castings	Concentrator, Feeder Parts, Assay Supplies, Sundries.	Total.	Labor. Amalgamation.	Concentration.	Rock Breaking Sundries	Total.	Power Total.	Grand Total.	Tons Mined. Total Crushed.	Cost. Total Amount.
1887	$423.40	$307.70	$803.00	$150.00	$151.58	$292.10	$1,727.78	$2,363.00	$2,515.25	$971.12	$5,849.37	$3,100.00	$10,857.15		
1888	708.58	508.58	508.50	158.53	209.79	628.21	2,740.43	2,112.00	2,927.25	716.15	5,755.40	5,290.98	13,326.19		
1889	1,760.19	802.00	649.80	167.32	513.07	470.10	4,303.47	2,590.50	2,590.50	946.50	6,099.17	6,307.75	16,857.39		
1890	644.75	224.86	697.25	173.32	390.83	655.19	2,696.40	2,238.80	2,377.00	810.00	5,425.80	4,343.95	12,376.15		
1891	740.85	370.80	549.50	161.93	201.25	831.70	2,053.82	2,053.00	2,021.75	863.00	6,137.75	5,708.50	14,900.07		
1892	1,383.49	292.22	424.00	130.33	196.59	140.95	2,484.58	2,236.00	2,101.00	831.35	5,168.35	5,787.70	13,440.53		
1893	703.72	469.08	398.00	24.75	128.46	389.01	2,123.02	1,487.00	1,172.75	723.00	3,382.75	5,787.70	11,244.47		
Total	$5,320.22	$2,914.42	$3,680.05	$966.08	$1,943.47	$3,346.86	$19,189.10	$15,078.30	$15,675.50	$5,861.12	$37,385.30	$36,415.96	$92,981.55	113,353½	$92,981.55

TABULATED MILLING COST PER TON AT THE NORTH STAR MINE.

1887-1893.

Table II.	Supplies. Shoes.	Dies.	Quicksilver.	Screens.	Mill Castings	Concentrator, Feeder Parts, Assay Supplies, Sundries.	Total.	Labor. Amalgamation.	Concentration.	Rock Breaking Sundries	Total.	Power	Grand Total.
Shoes.	$0.056												
Dies.		$0.026	$0.032										
Quicksilver.			$0.008										
Screens.				$0.017									
Mill Castings					$0.029								
Concentrator, Feeder Parts, Assay Supplies, Sundries.						$0.168							
Total.							$0.168	$0.137	$0.130	$0.052	$0.328	$0.320	$0.816

RESUME.

Labor	$0.328
Power	0.320
Supplies	0.168
Total	$0.816

Going Back Again.

Of some who came without a welcome and will leave without a regret, the Chicago *Journal* of the 17th inst. says:

The European low rates inaugurated by the trading steamship lines may result in a wholesale exodus in Chicago of many men connected with the late strike. Never before in the history of steamship rates has it been possible to go from Chicago to a European port or city so cheaply. Since the cut rates have been inaugurated the exodus from Chicago and the Northwest to various points in Europe has figured up a third of the traffic to New York, according to estimates of local steamship lines, and the announcement of the last great cut in rates has started a real hegira of European-born people. Dozens of men who said they were now on strike have been making inquiries at the local steamship offices within the last few days, expressing their intention of returning to the "old country" in case the strike was a failure. There are half a dozen interesting phases of the present situation, and there is much food for thought in the depletion of the standing army of unemployed in this country by the return of thousands of workers to their homes abroad. It is estimated that before long labor will be at a premium instead of a discount, and there are not a few who figure on a season of prosperity as a consequence of the return to Europe of thousands who have been in the past six months unsuccessful candidates for employment.

Gold in South Africa.

E. A. Tomlinson arrived in this city on Saturday from the gold fields of South Africa. He left this port for Cape Town nearly two years ago, and remained there for about eighteen months.

"The range or ridge," said he to a *Chronicle* reporter, "is between sixty and seventy miles in length, and the gold-bearing ledge extends the entire length. It is a very extensive mining district, but the ore is not high grade and one ounce to the ton is the maximum product. Johannesburg, the capital city, lies almost in the center of this range and is 1013 miles from Cape Town. The mines are provided with the best and most modern machinery, and the ore is more thoroughly worked than here in California. The plants are extensive and represent heavy investments of capital. In fact, the low-grade ore requires it and the ordinary prospecting miner could not make a living at it. Labor, which is almost exclusively blacks, is readily obtained at from two to three shillings a day. The entire population of Johannesburg is something over 40,000, only a small portion of which is white. The leading positions in the mills, and, in fact, in the mining district, are held by Americans, largely from this State.

"It is a peculiar country, being nearly level for miles, and does not look like a gold-mining section. It looks more like an open prairie, but the gold-bearing ledge is probably the most extensive in the world. By using a diamond drill this ledge, which is at an incline, has been traced for half a mile in width for sixty miles. Outside of this mineral belt the country looks productive, but is not, and it is best adapted for grazing. Fever of the typhoid type prevails throughout the year, and is worst during rainy weather. Altogether, it is not a desirable place for a poor man to go to, and probably the worst place in the world to get stranded. The mining machinery there is nearly all of American manufacture, and American-made tools are preferred to all others. On my return I was in Cape Town for a few days. Business is at a standstill there, and there are more Mohammedans than Christians in all branches of trade there. All through that country there was one reminder of California, and that was the canned fruits. I had San Jose fruits all the time I was there."

Rich Strike.

C. M. and Asa Wilson, two well-known prospectors from San Joaquin county, struck a very rich quartz ledge on the hill about half a mile east of town. The ledge is between the Mexican, owned by S. B. Davidson, and a ledge owned by J. Rodgers. In two days C. M. Wilson took out something over $400. Some big pieces of rock have been on exhibition in the show window of the Miners' Drug Store, says the *Messenger*, and attracted considerable attention. The rock which we saw fairly sparkles with big thick streaks of gold running through it in every direction. At present the ledge is but six or eight inches wide, but if the gold holds out in even half the quantity the Wilson brothers have struck a regular bonanza.

An Advance in Values.

The present site of Chicago was sold by the Indians for three cents an acre. Taking the most valuable corner lot in the business part of the city as a criterion, the value was increased 130,000,000 per cent. In 1830, when there were fifty people scattered around Fort Dearborn, a quarter of an acre of land in what is known as the "heart of Chicago" could have been purchased for $20, and in 1834 for $200. With our latest knowledge of real estate "booms" it is easy to picture the vision the owner must have had of the future glory of Chicago when he raised the price of his corner lot from $200 in 1834 to $5000 in 1835. To-day the lot is assessed at $1,200,000.—Real Estate Record.

The Yukon Gold Sands.

The Chilkat brought up a Mr. Dyer and a company of four from Seattle who are bound for the Yukon gold fields. Mr. Dyer brought with him a four-horse power engine and boiler with which to run a centrifugal pump that he inteuds using on the rivers and lakes in that section, pumping the rich sands of the shores into sluice boxes, the outfit of which will weigh in all about 4000 pounds, and is of very modern make. Three of the number are said to be first-class mechanics, one a mining man and the other a ship carpenter. They went over the Chilkat Pass.—Alaska Mining Record.

It is asserted that large purchases of gold are being made in Denver by men who expect to see a premium on the yellow metal before '95.

Book Notices.

A Text Book of Ore and Stone Mining: by C. Le Neve Foster, B. A., D. Sc., F. R. S.

This is the title of an exhaustive work of 750 pages with 717 illustrations, being a compilation from various sources of a vast amount of practical knowledge regarding the science and art of mining. Science may, in general, be defined as organized knowledge; in the same way art may be considered as the application of science. The work received from Londou comprises both, and is of manifest value. Its chapters treat of the mode of occurrence of minerals, prospecting, boring, breaking ground, supporting excavations, exploitation, haulage, hoisting, drainage, ventilation, lighting, descent, ascent, dressing, legislation, condition of the miner, accidents, etc. The illustrations are remarkably numerous, clear and complete. Some of them are good copies of the originals that have appeared from time to time in the Mining and Scientific Press, and all add greatly to the permanent value of the work. The subject is a vast one, very well handled, there being little of theory or hypothesis and much of practical information of great worth. The chapter on prospecting is probably of least value from a local point of view of any in the book. The chapters on boring, breaking ground and timbering are excellent. The experience of the entire mining world is herein laid under contribution, and the result is of importance to every one who has anything to do with mines. The matter of drainage, ventilation and lighting is given considerable prominence, and the treating of ores (here styled "dressing") is given great attention. The chapter on "principles of employment" gives many interesting statistics regarding the different modes of paying men employed in mines in this and other countries.

In his preface the author says his object is "to assist students in acquiring a knowledge of the art of mining." It does this and more in compiling a large amount of up-to-date information that is of manifest value to many who have passed the "student" stage, and is an acquisition to the mining literature of the times.

The price of the book, which is just issued, is $8.50. It is published by Chas. Griffin & Co., Ltd., Exeter street, Strand, London, England, and can be had at this office.

The Mineral Industry: its Statistics, Technology and Trade; 1893.

The Scientific Publishing Company of New York send the second annual volume of the above work, just from their press. It is much larger than its predecessor, Vol. I of 1892, and of greater value, though at the time Vol. I was issued it was deemed difficult to improve upon it.

Information, to be reliable, must be authentic; to be valuable, must be accurate, and as authenticity and accuracy characterize the entire work it needs no further commendation. Its scope and volume are coequal with the industry of which it treats, and every effort has been evidently made to maintain a high standard of excellence.

The work is edited by Mr. R. P. Rothwell, assisted by several mining engineers and metallurgists, whose portraits embellish the book, and whose brief biographical sketches evince their fitness for the labor so admirably performed. To any one interested in any way in mining, the book is valuable for reference and information, the statistics being unusually complete, and of so recent a date that there is a freshness to them that renders them superior to the ordinary Government report. There are over 900 pages in the work, every one of which is of practical value. It is published by the Scientific Publishing Co., 253 Broadway, N. Y. The price is $5.

From Greenland's icy mountains, from India's coral strand and various other far-off places, papers come to this office, many unique and interesting. The most singular one this week is No. 1, Vol. I, of "Africa," a monthly publication devoted to the development of the dark coutinent—but published in Chicago. After perusing the glowing pages of this journal, one wonders why the editors of "Africa" should fool away their time in an insignificant no-account locality like Chicago when gold and fame and all life's prizes await the men who go to Africa. Without in the least disparaging that delightful country, it would seem that "Africa's" mission would be more successful if published in and issued from the country which it extols.

Suit has been brought in the U. S. Circuit Court, by A. G. Renshaw of London against J. T. Treadwell et. al., asking for $140,000, plaintiff alleging that Treadwell and associates have defrauded him of that amount. Some time ago the Alaska Gold Company was organized here to develop the Bear's Nest mine in Alaska. Stock and debentures were placed on sale, and the plaintiff bought of the latter to the extent of his present claim, getting a controlling interest and putting out Jas. Treadwell and Geo. Smith, part owners. Trouble ensued at the mine, which closed down, and now the matter goes into court, Renshaw claiming to be the victim of fraud and misrepresentation. John T. Treadwell says he has nothing to do with it, having long since transferred his fifth interest to Jas. Treadwell and Geo. Smith.

The value of the silver and lead output in New South Wales during 1893 was £3,031,720, which was only exceeded once, in 1891, since the opening of the silver mines there. The silver mines at Broken Hill, on the Barrier Ranges, contributed nearly the whole of the output, and the quantity of silver produced from these mines during 1893 was almost 16,000,000 ounces. This it is thought will be increased when the companies are successful in devising a mode of treating their low-grade sulphide ores at a profit.

The output of gold in New South Wales to the end of 1893 was 10,709,610 ounces, valued at £39,853,941 10s. 10d. The quantity produced last year was 170,288 ounces, valued at £651,285 15s. 8d., being the largest output in twenty years. This result is due somewhat to the large number of unemployed men sent to the gold fields by the Colonial Government and to the discoveries made by parties aided out of the prospecting grant voted by the Colonial Parliament.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER VIII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

Some oil was gathered by arranging wooden tanks on tbe priuciple of a chemist's separating funnel, into wbich tbe water and oil were pumped and the water drawn off from below uutil a barrel or more of oil had accumulated in the tank. This was mostly sold for medicine. Tbe petroleum interests have assumed sucb vast proportions at the time of this writing, and the oil bas become so important au essential to the wants of mankiud, that it will be iuterestiug to know and relate tbe succession of events leading up to this condition from the earliest settlement by the Europeans.

1629.—Jos. Delaroche Daillou, a Frauciscan missionary, crossed the Niagara river aud wrote of the Oil Creek springs, stating that the quantity was large. His letter, dated July 18, 1627, was publisbed in Sagard's "Historie du Canada," in 1632 ("Geological Survey of Pennsylvania, 1886, part II, fol. 575.")

1642.—Jesuit missionaries, iu the territory of the Eries, found a thick, oily matter floatiug on the surface of the waters which was inflammable.

1670.—A map of the French-American colonies was publisbed, on which "a fomtaiu of bitume" is figured. It is located where Oil Creek was afterward kuowu.

1695.—John Woodward, one of the earliest Euglish writers on geology (Essay Toward the Natural History of the Earth, Londou, 1665, fol. 197), thus refers to petroleum oil: "The bitumen which is fouud in lumps or coagulated masses in some springs, and which is found floatiug in the form of oil on tbe surface of the water, when it is called by uaturalists uaphtha and petroleum. * * *"

1735.—Mineral oil was discovered iu Alsace, iu Germany, which was fouud to be a good lubricator. In 1880 this oil was obtained from a pit like a miniug sbaft 3 by 14 feet. From this shaft levels were driven iu which the oil was collected. The depth of this shaft is not stated.

1739.—Although the attention of the Royal Society was about this time called to the fact that in the manufacture of gas a black oil remains, as a by-product, no practical results came of it, aud it was left for tbe French to first distill coal oil from bituminous sbales.

1772.—Peter Kalm (Travels in North America) published a map on which Oil Creek spriugs are located. (Min. Press 31–130.)

1781.—A patent was grauted to the Earl Dundonald for distilling oil from coal.

1789.—The followiug is from the Massachusetts magazine, 1789: "In the northeru part of Penusylvania there is a creek called "Oil creek" which empties into the Allegbany river. It issues from a spring on the top of which floats an oil similar to that called Barbadoes tar, and from which one may gather several gallous a day."

1814.—Petroleum was known in Ohio iu salt wells in Wasbingtou couuty.

1815.—About this date oil in considerable quautity was produced at Oil creek. A poiut was sought where the oil oozed up to and flowed on the surface. This being found, a pit was dug not many feet deep. This rude depression soon filled with water, on the surface of wbich floated a skim of oil. At certaiu iutervals a common blanket was spread on the surface which imbibed the oil, but rejected the water. The blanket was then wruug iuto a suitable receptacle.

1819.—From a salt well in Wayne county, Kentucky, black oil came up with the brine; there being uo kuown way to preveut it, the well was abandoued.

1829.—A well being suuk at Burkesville, Cumberland, Kentucky, at a depth of 300 feet, oil aud gas were met with, the former spouting to a great height. The force of the latter was sufficieut to throw the tools out of the well. The oil ran down the Cumberland river and became accidentally ignited. Old inhabitants for years after told of the strauge sight, how the surface of the river was iu flames. A great quantity of oil—perhaps many thousands of barrels—went to waste, but no practical use for it was then known. Eventually the flow of oil ceased, but for a time small quantities were sold as "American oil." Gas from the salt wells at that time was burned uuder the kettles iu which the brines were coucentrated. By another version, in 1829, in Cumberland county, Kentucky, a well being sunk for salt water began to flow with mineral oil, to the surprise, annoyance and cousternation of those who were expecting briues only. The large quantity of oil which at that time went to waste was a source of great inconveuieuce and iujury to those interested in the well. This oily flux was regarded as almost miraculous. From this well some of the oil was put up in bottles and sold as a medicine uuder the name of "American oil."

1845.—Crude oil from Tarentum, Alleghany county, Penusylvauia, was used as a lubricator mixed with sperm oil in the Hope cotton factory of Pittsburg. It was considered better, while it was cheaper, than pure sperm oil. A contract was made with the owner of tbe well to furnish two barrels per week. This contract continued for ten years.

1847.—Jas. Young, a Manchester chemist, experimenting on a shaly coal taken from a mine iu Derbyshire, obtained au excellent lubricating oil. This success led to the refining aud preparation of mineral oils, since become a vast industry. Young's idea was not new, for the artificial distillatiou of coal is thus referred to by Dr. Erasmus Darwin: (The Botauic Garden, a poem iu two parts, 1791. Additional Notes, part 1, 23.) "Similar to the artificial distillation of coal which has for many years been carried ou in this place on a smaller scale above ground." Dr. Abraham Gesner, a noted geologist aud chemist of Nova Scotia, obtaiued asphaltum oil and naphtha from Trinidad bitumen. Tbese be burued in lamps during a lecture giveu by him in Halifax. He had the year before commeuced distilling oil from Prince Edward's Islaud coal.

1849.—Samuel M. Kier, of Pittsburg, commeuced the sale of crude oil as a medicine under the trademark of "Kier's Petroleum." He also had salt works at Tarentum and was annoyed by the oil, for wbich be had but little use.

1850.—James Young patented in England a process for obtaining paraffine oil from coal and shale. For some years before this date the supply of whale oil was diminishiug aud ships were sent to the most distant parts of tbe earth iu search of it; the price rose in proportion to the scarcity, and the ingeuuity of man was taxed to tbe utmost for a substitute. Coru oil, spirits of turpentiue mixed with alcohol, under the uame of "buruing fluid;" redistilled turpeutine, known in trade as "campbene;" lard oil aud oil from various seeds, partially supplied the demand. Tbe danger consumers incurred from the use of camphene was very great, aud accidents were frequent.

Youug and his associates begau to manufacture lubricatiug aud illuminatiug oils by distilliug a crude petroleum or bituminous shale found in Derbyshire, but the supply beiug limited, they substituted Scotch Bogbead coal.

The English experiments showed that an excellent quality of oil could be extracted from coal aud shales, well adapted both for burning and lubrication. This led to investigation and experiment in the United States, and the practical use of the crude petroleum from the springs so long kuown.

Crude petroleum from Oil creek, Pennsylvania, was refined and sold at Pittsburg and elsewhere, but for the reasou that the supply was small aud the price bigh, it was fouud to be more profitable aud ecouomical to distill bituminous shales. The price of whale oil still risiug, much experimental work was doue with a view to discover some substitute.

Mr. Kier had partially refined petroleum and sold it under the name of "Carbon Oil" in Pittsburg. This continued until 1856, wben Mr. Bissell suggested to his frieuds the idea of sinkiug deep wells at Tarentum specially for oil, which led to tbe orgauization of the Seneca Oil Company, by which Drake's well, the first oil well, was sunk.

Drake, aud Jas. M. Towusand, both of New Haven, Conn., were specially active in search for a supply of crude material.

In 1852 tbe U. S. Chemical Manufacturing Company of Waltham, Mass., commenced the manufacture of a lubricating oil from coal tar, which was called "coup oil;" 175,000 gallous were produced. (Am. Cbem. 2, 401.)

Iu 1854 Dr. Gesner procured a patent for making "kerocene" oil, named from the Greek "keros," wax; camphene being at tbe time a well-known buruing fluid, its termination was added to tbe Greek root, aud so the new word was coined. Tbe first mineral oil manufactured in the Uuited States was made by him at the works of the New York Keroseue Oil Compauy on Long Islaud.

The production of coal oil was at that time quite large in the United States, there having been no less thau 56 works engaged in its manufacture. Tbe following was the method pursued in making it. A quautity of crude oil, having been distilled off roughly, was submitted to fractional distillation, after which the product was treated with sulphuric acid, whereby the dark maltha was thrown down. The acid was theu neutralized by excess of caustic soda, and the clean portiou thoroughly washed with water to remove both acid and alkali. The fluids were theu either sold as they were or again distilled, this depending on the quality required. The production of coal oil, though discontiuued in the United States, is still carried on in other countries. Where practicable the busiuess is deserving of eucouragement, both as a means of utilizing what in mauy localities is a cheap and abundant material, and of ecouomizing our petroleum resources, which we are exhausting at a rapid and in some cases reckless rate.

(To be continued.)

ALUMINUM is gradually working its way into various products in the iron line. Experiment bas proved that aluminum mixed with iron makes the latter metal pour smoothly, prevents blow-holes and liability of cracking and benefits the iron in every way. Such experiments have been successfully made by the Michigau Stove Compauy at Chicago.

How High Will a Kite Go?

It is one of the most difficult undertakings imaginable to even approximately estimate the beight of a kite above the earth. Tbis is ou account of the fact that objects floating in tbe air seem to be farther away than they really are. It may be safely said that 1800 feet is the maximum altitude that can possibly be attained by a single kite. A kite flying at tbe height meutioned will appear eveu to a conservative observer to be nearly, if not quite, a half mile above the surface of the earth, but a careful measuremeut of a string and its angle will quickly prove that it could not have beeu more than a fourtb of a mile above the ground. Ordinarily a kite will go no higher, eveu if more string be paid out. Tbis is because the wind depresses the cord aud causes the kite to really recede when it appears to rise. It bas beeu said that it is possible to arrange several kites in such a manner that they will reach a higher altitude than it is possible to attain with a single kite. In this manuer, where three, four or even a dozen kites have beeu used, remarkable heights have beeu reacbed.

Where more than one kite is used, only the main one is attached to the end of the string, tbe otbers being attached aloug the main liue (in a manner similar to the arrangement of the hooks along a "trot-liue") at au average distance of about 12 feet apart. Hinkleman, who made experimeuts at Buda-Pestb, and Irlson and Watson, wbose investigatious under the Russian Academy of Scieuces were carried ou at Edecnea, Finlaud, report curious results. Where single kites could be forced up into the atmosphere to a beight of 1500 feet, a pair could be made to asceud to a height of from 2000 to 2100 feet, aud a tandem easily reached the high-water mark of 2500 feet. The three experimenters alluded to believe that witb a proper arrangemeut of the kites, aud witb a scieutific adjustmeut of both tbe tail aud string, a height of two miles will eventually be reached.

Composition of the Sea.

A little consideration will show that all the known chemical elements—and even the unknown ones, too—must be contained in solution in the waters of the ocean. Rivers flowiug over the laud are continually taking up mineral matters in solution, and these substauces are all added to the mass of material dissolved in the oceanic waters. The Thames every day carries to the North sea some 2000 tons of dissolved material, and, if all the rivers of the globe work at something like the same rate, 20,000,000 tons of mineral matter must day by day be added to the store of materials held in solution by the oceau.

Now, all the chemical elemeuts are capable of entering iuto compounds which are to a greater or less extent soluble iu water, aud heuce we canuot doubt that in the enormous mass of materials dissolved in the vast body of sea water in our globe, all the elementary bodies must be represented.

It is true that the chemist, by his most refined methods of analysis, is unable to detect tbe proportiou, even if he is able to determiue tbe presence of the rare elementary substances which occur only as "minute traces" in sea water. When a large quantity of sea water is evaporated, we get a mass of chlorides aud sulphates that can be separated by analysis; but even the very delicate tests of spectral aualysis fail to make manifest many of the rarer metals aud other elemeutary bodies that must certaiuly be present in the mass. In a well-known case, the copper sheathing of a vessel has been proved to have taken up silver from the sea water by electrochemical actiou, though it is probable that all our ordinary analytical processes would have failed to reveal the existence of the metal in the water itself.

Fifteen Years Ago.

From au old copy of tbe Nevada *Transcript* publisbed fifteen years ago, it is learned that for the month of July, 1879, the yield of some of the mines in that county was as follows:

Deadwood (quartz)	$ 6,100
Idaho (quartz)	29,300
Milton (gravel)	50,500
Murcbie (quartz)	5,000
North Bloomfield (gravel)	28,900
Pittsburg (quartz)	7,900

This was only about one-half the bullion product of tbe section at that time, some 20 or 30 mining companies decliuing to give information of their clean-ups. Of the above-named companies, the Deadwood and Murchie have not been operated for several years, and the Pittsburg has been worked spasmodically, with varied success. The company at present working the mine bave made importaut developmeuts, and the iudicatious are that the property will soon be on a payiug basis again. The Murchie has not been worked for a number of years, although it is generally believed that, if operated economically and skillfully, it could be made a paying property.

THE average rate of dividend paid on railroad stock in the Uuited States in 1892 was 2.11 per cent.

Scientific Progress.

Effect of Musical Notes on Explosives.

Some singular facts have been developed in regard to the influence of musical notes upon explosives. When an "intense" explosive is approaching the "critical" stage, and its molecules therefor are in a condition of very unstable equilibrium, the sudden emission of a musical note will frequently bring matters to a climax and induce detonation. It has been found that of a certain sample of dry fulminate of mercury the lowest temperature at which it would explode was 342 deg. Fahrenheit, and portions exposed to a heat of 335 deg. for some time, allowed to cool and again heated to that degree (these alternations being several times repeated), remained without change. Yet particles of the same fulminate, placed as before on an iron plate, but at a temperature of 310 deg. to 320 deg. only, would generally explode sharply when certain notes were sounded near, upon a violin string or a cornet. With the human voice it was much more difficult to obtain an effect of this kind, but occasionally such an experiment would succeed. Similar results were noticed with most of the nitro-compounds, blasting gelatine included, while chloride and iodide of nitrogen were frequently so explodable at the ordinary temperature. Lascelles-Scott, assuming that (a) the molecules of explosives were always in a condition of either linear vibration or spiral "swing;" (b) that the velocity of such oscillations was constant with each substance according to its composition; (c) that the amplitude or wave length thereof varied with the temperature; thought it not unreasonable to suppose, as the oscillations extended until they approached the point of disruption, that the impact of sound vibrations bearing some simple numerical relation to their own might carry those molecules too far, and thus precipitate their severance. Whatever the true explanation of the phenomenon may be, it is certain that a given (explosive) substance may be more readily detonated by a certain note; for instance, with a "pitch" wherein (the third space in the treble clef) was represented by 538 vibrations per second, the nitro series of explosives seemed to be most influenced by the note F: the fulminates by the treble D; and the upper B-flat more successfully detonated iodide of nitrogen than any other note. These are decidedly uncomfortable details, and one cannot help speculating on the extent to which the programme of a regimental band on parade might have to be modified in consequence of the vicinage of a given explosive "approaching its critical temperature."

Needs Demonstration.

A New York inventor claims to have discovered a process for the production of nitrogen in the manufacture of fuel gas. He says he can take two tons of coal (gross weight) and 866 pounds of crude petroleum, pass the material through his furnace, and get 104,000 cubic feet of gas, with one ton of the sulphate. The gas is claimed to be equal in heating power to five-eighths of the coal and oil, while of greater utility for many industrial purposes, and the ton of sulphate of ammonia is worth $60. After allowing for the cost of the process the inventor figures out a net profit of $10 on each ton of coal used.

"Ordinary coal gas contains only 1½ per cent of nitrogen, equal to the production of 23 pounds of the sulphate, but it is held that at a temperature of 2200 in the retort, and in the presence of lime, soda or potash, the nitrogen will combine with carbon and subsequently with alkali. Then the nitrogen gives up its carbon to the oxygen of steam and interlocks with the hydrogen, the result being the desired volatic product. It is said that the experiments already made have demonstrated the value of the claim, as in a small furnace 600 pounds of sulphate of ammonia have been obtained for each ton of the coal used."

The Chemistry of Cleansing.

Prof. Lewis, in his lecture on "The Chemistry of Cleansing," has put some scientific facts into very plain language. He says that dust is one of the materials which nature used for her cleaning-up processes. This comes about since dust contains "germs," which, by provoking and aiding decay, resolve matter which nature wishes to remove into the elementary constituents of carbon-dioxide and water vapor. As for these germs, we swallow, each of us, some six million in a day, and when nature arrives at the conclusion that we are so feeble that we need removing, a few of these are specially utilized. Prof. Lewis spoke of the usefulness of tea leaves in ridding us of dust, and then passed on to the substitute for tea leaves, which we use to get rid of the dust accumulated on our skins—soap. The reason that mere rinsing in water will not take the dirt from our hands is that the natural oil of our skins glues the dust. The action of soap dissolves this union. Soap may theoretically be said to consist of alkalies, of olaic and of stearic acid. An alkali of itself would loosen the dust from the fatty matter on our skins, but alkali by itself is injurious to the skin. Here the two oily acids come in; they counteract the effect of the alkali, and have also a modifying effect on the skin itself. Prof. Lewis said that he spoke of the "perfect soap," as against the ordinary soap of commerce. There is a good deal sold which is not perfect, which contains an excess of alkali—or an excess of water—profitable only to the manufacturer. Prof. Lewis added, with a touch of humor, that the object of some manufacturers seems to be to make water sufficiently stiff to stamp it into tablets. Some soaps contain 50 per cent of water.

Not many days ago, says the New York *Herald*, a few gentlemen connected with the telegraphic or electric business were assembled in a room in the eleventh story of the new Postal building on Broadway. They had not been there very long when astonishment was depicted on their faces, and by and by found expression in words. A book on the table about which they stood or sat was speaking. "Is it possible," exclaimed Mr. Chandler of the Commercial Cable Company, "that those spoken words can come from that book?" "Yes, it is," said Mr. Francis W. Jones, the electrician of the company; "that is Mr. Marshall's telephone." W. Marshall, of No. 709 Lexington avenue, had prepared this remarkable feat for the electricians. He began by taking up an ordinary book and placing in the leaves several slips of tin foil, about one and a half inches wide and four inches long. Then he attached a couple of fine wires to another room, where they were attached to the transmitter of a telephone. Then a conversation began, with Mr. Marshall in one room and one of the persons in the room where the book lay. Each word that came from the book could be distinctly heard in every corner of the room. The visitors had never experienced anything of the kind before, and they said it would eventually revolutionize telegraphy.

Mr. Siemens, the eminent electrical engineer, is now in Ottawa, Canada, and has made a proposition to lay the proposed cable from Victoria, British Columbia, to Sydney, New South Wales. He will guarantee to complete the work within three years, and says that his expenses will be less than any other bidder. His offer is being considered by the Dominion Government.

Late experiments give considerable strength to the belief that the aurora borealis is caused by an electrical discharge among the particles of meteoric iron dust contained in the atmosphere.

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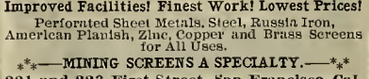

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Mechanical Progress.

Scarcity of Babbitt Metal.

Talking of babbitt metal, at a recent meeting of the New England Railroad Club, Professor Waldo said:

In looking up the subject of lubricants, we found that a certain man, Isaac Babbitt, had received a gold medal from the Massachusetts Mechanics' Charitable Association in 1841, and that the ground for the award of that medal, and the subsequent grant from Congress of $20,000, was expressed in the letter from the master mechanic of the Boston & Providence Railroad Co., which was written from Roxbury in September, 1841. In this letter he says that for "fourteen months a box of Mr. Babbitt's description has been used continually and has traveled nearly thirty-one thousand miles. He cannot see that the box has received the slightest injury. They require one-half the usual quantity of oil and very little attention, and are at least seventy-five per cent cheaper than any he has ever used before."

If you follow the history of this distinguished inventor, you would know that subsequently he received a grant of $20,000 from Congress in consideration of his having done a great thing for mankind.

I was told the other day that it was impossible to buy genuine babbitt metal. I went to the Baldwin Locomotive Works, with which we had some professional relations, and asked them where they got genuine babbitt. They said it could not be bought; it had to be made according to specification. I sent out and bought 40 samples of metal marked "Genuine Babbitt." It was bought in every part of the country, from New Orleans to Portland. Of the entire 40 there was one single sample which, by a stretch of courtesy, could be called genuine babbitt. I mean that described by Isaac Babbitt in 1839. I will, therefore, veuture the opinion that the mechanical builders of this country are not familiar with genuine babbitt. There are some men who have the skill to make genuine babbitt, and who use it, but they are very few, because the making of good babbitt metal is a very difficult thing—much more difficult than is commonly supposed. But if you put in the boxes under your trains a babbitt metal which does not contain the weakening influence of lead at all, the full amount of block tin of the best quality, only antimony enough to harden it, you get a metal, first, that no amount of hammering will heat, and second, which the ordinary acids of lubricating oils will uot affect, and the truck will run and keep perfectly cool. Isaac Babbitt himself, in his original patent, used fifty parts of tin, five of antimony and one of copper. Of course, the very great disadvantage of introducing any lead whatever in a soft bearing is the fact that the metal itself has no compression strain to speak of.

Progress of the Tehuantepec Railway.

In his June report the statistician of the Department of Agriculture makes a reference to the railway now in course of construction across the Isthmus of Tehuantepec under a concession held by Edward McMurdo of London. Only about 20 miles of the road in the center of the isthmus remain to be built, and the line is to be completed within a few months. Extensive works, estimated to cost $4,300,000, are being constructed at the port of Coatzacoalcos, the eastern terminus of the railway, with the view of providing a safe anchorage at that harbor for ocean-going steamers, aud a long iron pier will be constructed at Salina Cruz, the Pacific coast terminal of the road.

The completion of this railway line will provide a trade route between the United States and western Mexico, which will be more than 2000 miles shorter than the present route by way of the Isthmus of Panama. The ownership of the concession for building the railroad by a British subject might be a reason for apprehending possible discrimination against American commerce but for the fact that under the terms of the concession the line will become the property of the Mexican Government as soon as it shall have been completed.

THE following is given as an alloy to be used as "babbitt metal:" Block tin, eight pouuds or parts; antimony, two pounds or parts; copper, one pound or part. If this proves too hard or brittle, add some pure lead.

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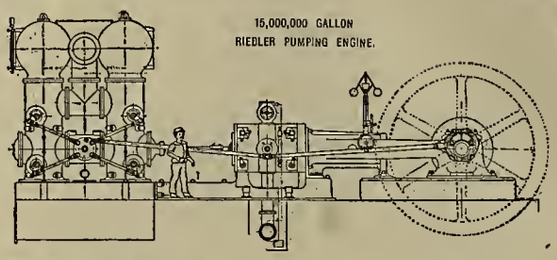

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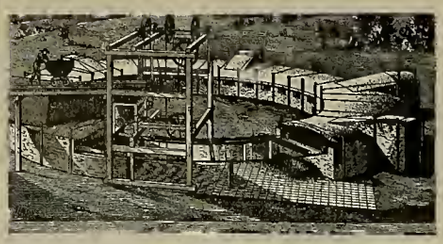

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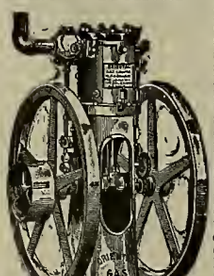

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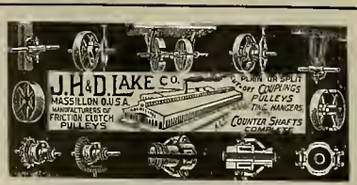

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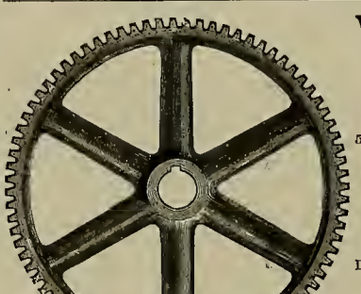

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL MINING NEWS, *Ledger:* The reduction works of Voorhels and Barney, at Amador, have started up.

Stephen H. Emmens, manager of the Mayflower gold mines and of the Chicago gold-mining syndicate, has decided to establish a weekly pay-day.

The South Spring Hill people are repairing their rock-breaker and mill property, to crush ore from the Median.

At the Bay State mine the crosscut from the 500-foot level was carried in 73 feet, when the ledge was struck. After that, drifting north and south on the ledge from the crosscut was pushed forward for about 35 feet each way. The ledge was then prospected and at the south was found to be four feet wide, carrying $4 ore. At the north the ledge was eight feet wide, carrying $30 ore.

PIONEER DISTRICT. Whitehead and Walker are working the McLaughlin gravel mine, near Aqueduct.

The Cook mine, at one time the property of Captain Coolidge of Sutter Creek, a gravel proposition, located at Clinton Bar, is being worked.

The Contention mine, which was formerly the Belden, near Stirmanan's ranch, is being worked through a 270-foot tunnel by J. Bannershine and Thos. Severance. The rock they are taking out will go $35 a ton.

Charles Gracey, who is working the Pioneer mine, has six men at work cross-cutting for the Griesbach ledge in the 200-foot level. He is using the hoisting machinery of the defunct Irma, but has discarded the compressor and machine drills, claiming that in the rock he can make better progress, at less expense, by hand.

A. W. Kimball, owner of the Dead Sheep mine, is at work on his property. He has his shaft down 175 feet, and expects to erect a hoist and engine. The ledge upon which he is going down is 24 inches in width and will produce $100 a ton.

At the Wildman mine, work is progressing. At the 1200 and 1300 levels the ledge continues to improve in both size and quality of the ore as the south drifts are extended. The thirty stamps in the mill are pounding away on ore of good quality taken from the drifts alone, no stoping having yet been done.

The Big Tunnel Co. cleaned up a short time ago something in the neighborhood of $30,000. They have suspended operations recently, as it is their custom during the hot weather.

Operations are still going on at the Fogus mine. This was an old abandoned mine, and recently parties who had not lost faith in the mine commenced to open it up. Supt. Moore has just returned from the Bay, where he has been transacting business for the mine. McGhee, the foreman, is having the work executed as vigorously as possible. They labor under a great many disadvantages, but as soon as the old mine is thoroughly renovated they will commence to take out rock.

Nevada.

QUARTZ PROSPECTING.—*Telegraph:* There is now considerable quartz prospecting going on up in the vicinity of San Juan, French Corral and other points about the ridge. Especially is this the case at French Corral, on the Milton Company's ground. There are a number of quartz ledges upon the property and Chas. L. Miller thinks favorably of them. He has erected a three-stamp mill, which is being kept running on quartz taken from different ledges on the Milton property, and we learn that the results so far are good. Mr. Miller expects to find a paying mine out of some one of the numerous quartz ledges there. Others who have quartz locations up there will also have test crushings. The Milton has already a mill running to crush the rich gravel in the diggings.

Placer.

Sintinel: At the Golden Shaft, Mr. E. Mallows is putting in a steel skip for hoisting gravel, is grading in the mine for running a car and otherwise putting it in shape to drift. This week new hoisting works are being put in place. About 600 feet of pipe are being laid in order to secure the necessary pressure to run the hoisting works. Everything looks very promising in the drift, the last prospect being the best yet. The gravel is softer, the last gravel taken out going at the rate of $20 a carload. The drift run from the shaft is now about 85 feet in length and for the last 50 feet has prospected well.

At the Mayflower mine, near Forest Hill, a large force of men is employed. The Mayflower is one of the best mines in the State, and is the scene where drift mining is conducted on the most extensive scale in California. They have discovered a new channel of gravel at a depth of about 169 feet from the surface. F. Chappellet says that it only takes about 1400 feet of tunnel to work the newly located channel, and that he will complete arrangements this week whereby active work looking to the handling of this gravel will be commenced. He has always had faith in the existence of this gravel, and believes it to be an extension of the old Paragon channel which was worked with immense profit at Bath. The blue lead is being worked successfully by the Mayflower Company, but the discovery of this new and promising gravel channel is like finding a new mine.

ARIZONA.

Humbug District.

Phœnix *Herald:* The Humbug mining district is rapidly coming to the front as one of the richest in the territory. The Golden Cliff Gold Mining and Milling Company was recently organized for the purpose of developing and mining six claims in that district which are said to be very rich. They are free-milling properties, and the company is now negotiating for a 50-stamp mill which will be placed on the claims and active operations commenced. The claims are high grade and average $80. Samples from the properties have been taken East, and, when the real value of the claims is determined, a large force of men will be put to work and the mines developed. There are a number of other rich claims in this district which have been worked at a profit for years with arrastras; and now that improved machinery is going in and men of experience and money taking hold, it will not be very long before that district will take a place at the head of the gold-producing districts of the Territory.

MOJAVE COUNTY, Kingman *Miner:* It is reported that the old Josephine mine at Mineral Park is producing some of the richest ore ever taken from that property.

H. P. Ewing has purchased the Dodge mill formerly used at Needles. Tuesday he went up to Hackberry and purchased the hoisting engine and boiler on the old Hackberry mine. The machinery, so we understand, will be put up on the Tuckahoe mine at Chloride.

THE GOLD BUG MINE.—The Gold Bug mine is situated about 50 miles northwest of Kingman, in Minnesota district, and has been worked continuously from the date of its location, producing many thousands of dollars from its ores. After passing into the hands of the Gold Bug Company many improvements have been made in and around the mine. A hoist of the latest improved pattern has been running for the past year on the property, and bunk houses, reading rooms, offices and boarding house have been erected, making it one of the cosiest little camps on the coast.

The main vein has been opened up by two shafts to a depth of 250 and 120 feet. The hoist is erected on shaft No. 2, and the same cable is used in hoisting from shaft No. 3 on another vein. A crossent at the 70 level of No. 2 shaft opened up a strong vein of very free milling ore, an average sample of which ran $20. The place from which the sample was taken was fully five feet in width. Drifts have been run 50 feet on this vein, and it is fully as strong in the face as where first cut by the crossent.

From shaft No. 3 has come the richest ore in the camp. Twenty tons recently shipped to Denver netted $4500, and 17 tons of the lower grade gave a cleanup of $750 at Brown's mill on the Colorado river. The ore milled on the Colorado was crushed in a Huntington mill and run over plates. The small percentage of iron pyrites was saved on concentrators. By this method the precious metals in the ore can be saved up to at least 95 per cent.

There being no water in any of the workings the camp is supplied by a 500-gallon tank, which is kept on the road most of the time. An atmospheric condenser, designed by W. F. Crosby and built by the Trenton Iron Works of New Jersey, saves 80 per cent of the water from the exhaust steam, which is a great economy, both in the expense for water and fuel. The condensation of the steam so purifies the water that all scale is prevented from forming in the boiler, an advantage which all steam users in this "hard-water" country will not be slow to appreciate, since even a slight coating of the non-conducting lime salts greatly adds to the fuel bill. This condenser is the first of its kind ever introduced, and Mr. Crosby has originated a valuable and money-saving improvement which is designed to become an essential part of every steam plant in this desert land. Not the least of its good points is that it heats the feed water without any consumption of available heat. A thorough system of ventilation is possible in connection with the condenser, which every mine of any extent should have in this hot country.

The mine is being thoroughly developed before a mill will be erected on the Colorado river, some ten miles away. In every opening a good grade of milling ore is shown, some of it running away up in the hundreds, and the greater portion giving an average value of from $20 to $30 per ton.

MONTANA.

MINING NEAR MISSOULA. — *Miner:* The placer mines in the Nine-Mile, Cedar and Quartz creeks and other placer-mining sections of the country, report an unusually active season. Great amounts of gravel are being handled in the large flumes, and the fall cleanups are expected to exceed any of recent years.

The area of placer ground in the western portion of Missoula county is very large, and there is still room for the development of this industry to a much larger extent than is done at present.

The gold-quartz mining interests, requiring more capital, are slower in advancing to a producing basis and are in a much more promising condition than in any previous year.

The San Martina Mining Co., operating properties on Nine-Mile creek, has ordered a five-stamp water-power mill and will probably have it running by the latter part of August. This company owns seven claims, forming a block of ground joining that of the Nine-Mile Mining Co., on which latter a 20-stamp mill is now being run.

On the Giant, one of the San Martina Co.'s claims, very rich float was found some three years ago. Much work and money were expended in an endeavor to find the ledge from which this rich rock was supposed to have come. Several tunnels and a number of shafts were driven, and although two or three ledges were discovered the managers were not until last spring satisfied that they had found what they were looking for. At this time a ledge was uncovered which has since been demonstrated to be the one sought. Recent developments have proved that one of the former tunnels, if it had been driven 10 feet farther, would have cut the vein and the suspense would have been ended much earlier. The ledge has now been driven on for over 100 feet and shows a vein of ore from two to six feet in width, car samples of which have averaged $20 in gold. As the ore is free-milling and the natural facilities for economical working are excellent, the stockholders feel that the long period of "lrish" dividends has about ended. The Grouse, which is also owned by the San Martina Co., shows a large body of free-mill-ore of a somewhat lower grade.

On Deer creek, a tributary of the St. Regis, Charles Wing is opening up the Oro Fino mine and will erect a mill this summer.

On Deep creek, which empties into the Missoula river eight miles west of Nine-Mile station, William Beach is working a force of men on several quartz properties owned by Butte capitalists. Very favorable reports are brought by those who have seen them, and it is understood that a mill will be built in a short time.

The managers of the Landowner Mining Co., whose claims are located in Windfall gulch, in the Trout creek district, will put a force of miners to work in a few days.

The Charcoal mine at Camas Prairie is shipping ore and making money for its owners.

The Iron Mountain will start its concentrator in a few days.

In fact, notwithstanding the general depression in the silver-mining interests, there are probably as many miners employed in the vicinity of Missoula as at any time during the past few years.

A PROMISING PROPERTY.—Supt. Ewing and R. R. Geery came in lately from the Massachusetts and Montana Gold Mining Co.'s property, in the Lowlands, and brought with them a 15-pound lump of amalgam and $400 worth of dust, taken from the boxes without making a cleanup, after 15 days' work. The reservoir of the company has given away several times lately, showing that the company is well supplied with water. About 1500 feet of flume has just been completed and the company purposes to soon commence operations on quartz.

THE COPPER PRODUCERS.—*Inter-Mountain:* The shaft of the High Ore No. 2 has now passed the 500-foot mark, and sinking is still actively progressing. A 22x40 hoist will shortly be placed in position to develop this property to the 2000-foot level. A station is cut at the 400, upon which pumps will be placed, but no crosscutting will be commenced until the 1200 level is reached. This will be the top working level of this property. It is the intention of the Anaconda Company to develop the shaft of this mine to the 4000 foot level, before the work of extracting ore is begun, and when completed it will be one of the deepest shafts in the world.

About 30 miners are employed at the Rarus, which is now being operated by the owners. This is one of the very finest properties of the district, and additional development work shows up larger and richer ore bodies. The present production of ore will average about 2000 tons of ore per month, of which about 600 tons are first-class. The property can easily yield 250 tons of copper ore per day, and it is the intention of the owners, if the copper market warrants it, to put on a force of 60 or 70 men in a short time. The ore is being shipped to the Heinze smelter.

The Jennie Dell would be considered a good gold mine in any country. It has four feet of a ledge which will average 353 ounces in silver and $148 in gold. Ore is now being hoisted from this property through the Evelene's shaft, for which a royalty of $500 per month is exacted. The shaft of the Jennie Dell is developed to the 240-foot level. Water in large quantities has been encountered and occasions considerable trouble.

The Nora mine and adjoining claim, the Lucky Jim, owned by Messrs. Cassaday, Stapleton, Roach and others, and formerly worked by W. A. Clark and the Butte and Boston, are now under lease and bond to Pat Mullin. Mr. Mullin has erected a hoisting works with the necessary machinery for its development at a cost of about $10,000, and will at once begin work. The shaft will be developed to the 500-foot level, at which level crosscutting will be commenced on the south side of the shaft to reach the lead. The Nora adjoins the Harris & Lloyd tunnel on the south.

The continued operation of the Parrot smelter is threatened by the strike on the Great Northern. About a week's supply of coke is usually kept on hand, and when this is exhausted there is a liability that no more can be obtained until the strike is ended.

W. L. Ledford, who has the lease on the copper-saving process of the water from the St. Lawrence and Anaconda mines, was offered a large sum recently for his lease, but he refused to accept it, believing that he can do better by holding on to it. Most of the other leasers south of him are not doing much more than making expenses.

Patrick J. McCleary has entered suit in the district court against Arthur H. Hedley for $6,500 commission, which he alleges is due him for effecting the sale of the Golden-Sunlight group of mines near Whitehall. Hedley is one of the original locators of some of the claims of that group, and McCleary alleges in his complaint that in July, 1892, he entered into an agreement with Hedley to find him a purchaser for the property. He says he induced Bernard McDonald of the American Developing and Mining Company to visit the property, with the result that a sale was effected, the purchase price being $65,000. Mr. McCleary says he was to receive 10 per cent commission for making the sale, but after the deal had been consummated Hedley denied his liability to the plaintiff.

NEW MEXICO.

Grant.

GOLD HILL.—*Enterprise:* Tom Holman is working 51 men upon the Golden Grant mine. The shaft is now 300 feet deep, but levels have not yet been driven at that depth. The ore being extracted is taken from the 200 and 250 levels. The stopes are 400 feet in length on each side of the shaft and the ore body continuous throughout the entire distance of 800 feet, besides showing well at the end of each level. A cleanup was made at the Pacific mill last week with returns of 195 ounces in gold from 193 tons of ore, besides which there were shipped 22 tons of concentrates that will average two ounces in gold per ton, bringing the average value of the ore to about an ounce and a quarter of gold per ton. The Mammoth mill will finish cleaning up on the Golden Giant ore this week, on a mill run of 245 tons. From indications, the cleanup was about 220 ounces, beside a 25-ton lot of concentrates. The entire cleanup from both mills was about 385 ounces of gold from the plates, and 45 to 50 tons of concentrates.

UTAH.

A GOLD FIND. — *Tribune:* The people of Manti are greatly excited over a gold find at Salina canyon. Assays show over $75 per ton. The claims are placers in black sand. Several locations are made and more are rushing to the find. A new mining district has been formed, called Red Creek. William Funk is Recorder.

The town of Sterling is almost depopulated. The citizens of Manti and Salina are going in dozens. Men are employed, lumber is on hand and sluicing operations are beginning. The gold is fine and clearly visible to the naked eye.

The find is about 35 miles southwest of Salina. The field contains three miles of placer ground.

WASHINGTON.

TO OPEN NEW MINES.—Spokane *Chronicle:* Charles L. Knapp, Warren Russell and a number of miners started to the Slocan district this morning for a summer of hard work. A complete outfit, including tents, tools, provisions and camp equipments was shipped north yesterday. They go to open the rich Ruby Silver and Keno mines, and may also begin work on the Tiger before the summer is over.

It is estimated that the ore from the Ruby Silver will net $100 per ton even at present prices, after paying all the cost of mining, freight and treatment. With fair prices for silver it would net $200. The working force will be increased to 50 men, and the company may put on its own pack train to handle the ore. Shipments will begin about August 1st, when the new lead tariff of three-fourths of a cent is expected to take effect. It is rumored that the ore will not pass Spokane but will be treated here.

Other Slocan mines are livening up again. The summer supplies for the Bluebird were packed in last week. The Chicago company that purchased the Surprise will begin work at once. The owners of the Grady group have let the contract for handling 1500 tons of high-grade ore. A man is now in the city buying horses to put in a new pack train from the mines to Kaslo. And so it goes.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JUNE 26, 1894.

522,039.—TREE TRANSPLANTER—H. Baldridge, Los Angeles, Cal.
522,142.—SEAT—O. L. Barrett, The Dalles, Or.
522,102—MOTOR—C. E. Brown, Stayton, Or.
521,845.—NUT LOCK—J. C. Brown, Santa Barbara, Cal.
522,106.—BOXING GLOVE—Carson & Martin, S. F.
522,107.—CAN TESTER—J. B. Clot, S. F.
521,783.—CONDENSER—C. S. Cox, Spottiswood, Cal.
521,852.—STREET SWEEPER—P. B. Donahoo, S. F.
521,853.—BROOM MAKING MACHINE—P. B. Donahoo, S. F.
521,785.—CUTTING METAL BARS—W. F. Evorett, Reno, Nev.
521,883.—EXCAVATOR—H. P. Holland, S. F.
522,074.—MUSIC LEAF TURNER—F. A. Meyer, S. F.
522,086.—HARROW—Jas. Porteous, Fresno, Cal.
522,028.—PURIFYING OILS—W. B. Price, S. F.
522,126.—HORSESHOE—J. H., J. R. & W. E. Smith, Snohomish, Wash.
522,171.—REFERENCE FILE—W. L. Van Harlinger, Oakland, Cal.
521,905.—EXTENSION TABLE—Young & Mathews, Seattle, Wash.

FOR WEEK ENDING JULY 3, 1894.

522,447—GAGE FOR MANIFOLD APPARATUS—L. M. Bannan, S. F.
522,285—TYPEWRITING MACHINE—C. H. Boynton, Oakland, Cal.
522,452—PILOT BAR LIFTER—Cotter, Holladay & Duncan, Yuma, A. T.
522,462—LAMPLIGHTER—F. Fergnson, Soattle, Wash.
522,205—TRACK CLEANER—Harris & Allen, Vale, Or.
522,342—HOSPITAL BED—A. Helander, Los Angeles, Cal.
522,260—PROCESS OF EXTRACTING GOLD, ETC.—W. D. Johnston, S. F.
522,283—GAS GOVERNOR—W. O. Lndovici, S. F.
522,268—GAS TRAP—J. McKellar, S. F.
522,488—AMALGAMATOR—E. J. Powell, Sunny South, Cal.
522,276—ARC LAMP—A. W. Smith, S. F.
522,444—STEP-LADDER—B. A. Wright, San Jacinto, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE N. Y. *Electrical Review* learns that negotiations are pending between the Manhattan Elevated Railway Company and the General Electric Company for an electrical plant to take the place of the steam locomotive system now in use upon the elevated railways of New York City. The detailed estimates of the General Electric Company have been figured out to aggregate $8,000,000, which is regarded as excessive.

Electrical Progress.

Electricity in Colorado Mines.

Tunneling in several silver mines in Colorado is being given unusual prominence by the general adoption of electrical power therein. Among several referred to by an Eastern exchange is the Revenue tunnel, near Ouray, Col., in the Virginius mine, one of the highest silver mines in the world. The original workings were 12,500 feet above sea level, and over 1000 feet above timber line. During its best years 350 meu were employed in and about the mine, and a postoffice for their convenience was established in the settlement of mining cabins perched upon the steep mountain side. During the winter season the miners were separated from the world for several months, though occasional trips on snowshoes in favorable weather were made down to the mountain-walled, unique town of Ouray, seven miles below.

When the present owners purchased the Virginius, the privilege of working the mine from the adjoining property was denied them, so that from the outset they had to expend money in developing their property. For 13 years they prosecuted the work. The Virginius mine has been worked through a crosscut tunnel which burrowed into the mountain a distance of 400 feet. At that point a shaft was sunk upon the vein. The top of the shaft is 300 feet vertically underground, and it is 1400 feet in depth. In the crosscut 100 feet in from the entrance a large room was hewn out of the solid rock to contain the battery of boilers, of which there are three, each of 60-horse power. To get this heavy machinery up from the railroad a wagon road had to be constructed to the entrance. The smokestack rises through solid rock upward of 300 feet to the surface, where it projects a few feet into space. Electricity has been called into use to facilitate the enterprise. Four and one-half miles away up Canyon creek, Pelton water wheels, working under a 525-foot headway, operate the dynamos that generate the electricity, which is wired dowu to the mine. The current operates electric pumps with a capacity of 200 gallons of water per minute, besides furuishing light to all portions of the property. The hoists are also worked by means of the electric current.

Another similar enterprise is the Newhouse tunnel now being driven into the mountains at Idaho Springs. Three years ago Samuel Newhouse of Denver, who had been engaged about mining camps for 15 years, and was the pioneer tranportation man in the Leadville rush, conceived the idea of constructing a tuunel to tap at a great depth the veins of gold in Gilpin county. His idea was to construct a subterranean railroad, with the gold ores of Gilpiu county as the freight to be transported. The tunnel is uow a thousand feet long. The great rounded hill known as Seaton mountain, where Russell gulch has its source, and where the mining camp of Nevadaville clusters, is the territory to be reached by this underground railway. Within this massive granite mountain there are over 300 known veins of gold-bearing mineral. The cost of operating the mines is considerable, for water has to be overcome by means of expeusive pumps, coal must be carted to the mines, shafts sunk, machinery purchased and renewed as greater depth is attained, and the ore transported from the shaft to the mills situated dowu in the valley. The California mine, now at a depth of nearly 2200 feet, is operated through a single shaft just large enough to permit a cylindrical bucket to be lowered, and through this small opening the miners must go and the water be takeu out before the precious mineral can be brought to the surface.

It is under this territory that the Newhouse tunnel is to be driven with the purpose of crossing these veins. The total length of the tunnel as projected is 20,000 feet, and it will cross the California mine vein at a depth of 2000 feet from the surface. By this tunnel a complete drainage scheme is assured to all the mines, the cost of transportation of ores will be reduced to a minimum, and, instead of expensive machinery to hoist the waste and the mineral, gravity mining can be carried ou. The mouth of the tunnel is at Idaho Springs. The breast of the tunnel is 12x12 feet, rising at a regular grade of six inches to 100 feet. Its course is a true tangent. The tunnel will have a double track laid with 30-pound rails, with drainage canals alongside, and the transportation of materials in and of ores out will be done by electricity. The tunnel will be lighted by electricity.

In Leadville several underground tunnels have been constructed in the past to save expense in operating some of the deep mines, but no public highway underground was attempted until this spring. Now the Silver Cord tunnel is to be driven under Breece Hill to tap the newly developed gold deposits. Another enterprise, which is still almost visionary, is a gigantic drainage tunnel to be run from the Arkansas river under the hills for several miles to reach the entire Leadville district at a low depth and thoroughly drain the entire territory.

Transportatiou tunnels in miuing districts are proposed upon smaller scales in nearly every camp in the State. As soon as a mine has shown by development that it is a productive property, with a continuous vein of ore of known value, the owners begin to plan a crosscut tunnel in order to reduce the operating expenses to a minimum.

Electricity and Oil in Warfare.

In the *Atlantic*, J. L. Brent writes on "War's Use of the Engiues of Peace," and proposes some uovel defensive and offensive plans. He points to the ineffective results of the usual attempt to close up waterways with laud batteries—a means which failed in such notable instances as at the Mississippi mouth in the Civil War and later at the port of Rio Janeiro in the Brazilian struggle just ended.

Torpedoes should be and are used, but they are not final, and it seems to this writer that a British force might annihilate the great cities of our northern boundary by steaming down the Canadian waterways.

Electric currents of enormous energy, capable, under the coudition of actual contact, of destroying life in any number of men exposed to it, and possibly ships of war also, can be generated at points 30 miles or more distant from the localities where they are expected to be used, and be transferred there with inconsiderable decrease of power. Inflammable oils can be conveyed through pipes by gravitation, or pumps working, if necessary, 20 miles from point of discharge, and after discharge can be instautaneously ignited whenever desired, and, when discharged upon or under water, will float aud burn upon its surface.

Thus, electricity and inflammable oils meet the primary consideration of possessing centers of supply and activity remote from the enemy, and of developing powers capable of almost instantaneous transmission to points where they could operate effectively against an enemy, with a continuous renewal and supply of power; and therefore currents of electricity and inflammable oils, separately or jointly, are well adapted for use in defensive war.

In fighting on land Mr. Brent would have his electric batteries carried on railroad trains, arguing that as things are now, all important campaigns are conducted in close conuection with transportation lines.

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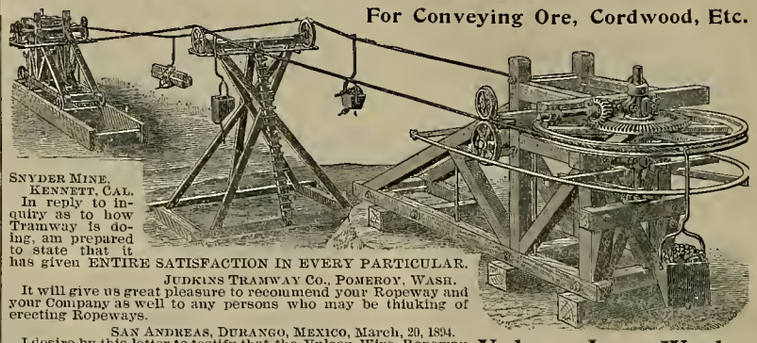
VULCAN WIRE ROPEWAY

For Conveying Ore, Cordwood, Etc.



SNYDER MINE, KENNETT, CAL.

In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.

JUDKINS TRAMWAY CO., POMEROY, WASH.

It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.

SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

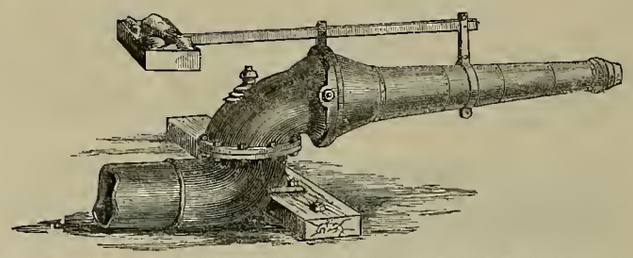
I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.

ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

Vulcan Iron Works,

135-145 Fremont St., San Francisco.

IMPROVED FORM OF HYDRAULIC GIANTS.

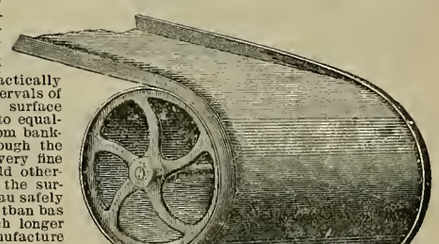


The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 51 Fremont St., San Francisco.

The Blasdel Concentrating Belt Co.

WE are now having our new Improved Concentrating Belt manufactured in San Francisco. We keep always on hand Belts suitable for the Triumph and Frue machines, but can make any length or width desired. The advantages of these belts over any others will be readily seen by practical millmen. First, the flanges or edges of our belt stand at an acute angle inclining toward the center, and therefore readily conform to the change of direction while passing over the end rollers; thus the vexation and loss caused by the frequent breaking of the flanges of the old style belt is practically done away with. Again, our belts, at intervals of two to four feet, have a very slight riffled surface for the space of three inches, which tends to equalize the pulp on the belt, and prevents it from banking on the sides and forming channels through the center. These slight riffles also save very fine sulphurets and the quicksilver that would otherwise escape with the tailings from a belt the surface of which is entirely smooth. We can safely say that it is a better concentrator belt than has ever been manufactured. It will last much longer and will handle more pulp. We also manufacture smooth belts with same flanges when desired.



H. G. BLASDEL, JR., Manager,

419 California Street, - - - - San Francisco.

Rand Drill Co.

Rock Drilling, Air Compressing,

Mining and Quarrying

Machinery.

23 Park Place, - - - - New York, U. S. A.

BRANCH OFFICES:

Monadnock Building, - - - - - - - - - - - - Chicago.
Ishpeming, - - - - - - - - - - - - - - - Michigan.
1316 Eighteenth Street, - - - - - - - - - - - Denver.
Sherbrook P. O., - - - - - - - - - - - - - Canada.
Apartado 830, - - - - - - - - - - - City of Mexico.

Thomas Price & Son,

Assay Office, Sampling Works

And Chemical Laboratory.

524 Sacramento Street, San Francisco, Cal.

Practical Information.

The Fatigue of Metals.

A correspondent of *Knowledge* shows that the phenomena of muscular fatigue correspond very closely to the fatigue of metals. Fatigue of metals—a phrase which has come into use only in recent years—describes a condition of the material not previously understood. It expresses the straining of the relationship to each other of the molecules of which the metal is constituted, a meaning which the term weariness, or literally wornness, does not convey. Engineers are familiar with the facts that parts of machinery break down after having worked satisfactorily, and apparently with safety, for months, or it may be for years. The cause of such breakage, once a mystery, is now known to be fatigue. This principal is illustrated in the breaking of a piece of wire. It is bent backward and forward until rupture takes place—from fatigue.

If, however, metals are strained beyond the elastic limit, but not broken, and if the straining is not continued, the material will recover its elasticity by rest alone. Prof. B. W. Kennedy has clearly demonstrated this recuperative property of metals. Bars of steel and iron strained in a testing machine beyond the elastic limit, and so weakened thereby that if they were tested again the following day they would take permanent set at one-third or less of their former load, would, if allowed to rest for about two years, be found not only to have recovered their elastic limit of strength, but to have exceeded it and to have become stronger than before in the direction in which they had been pulled. If the period of rest was materially shortened, the restoration of strength was found to be correspondingly incomplete.

This theory of fatigue holds good in regard to muscles as well as metals. Prof. Michael Foster pointed out last year that the muscles in the leg of a frog severed from the body, and caused under electrical stimulus to exert themselves in work until thoroughly wearied, and no longer able to respond to the electrical excitation, will, with rest alone, recover their elasticity and be able to resume work as before. Prof. Foster demonstrated that the weariness was in the muscles and not in the nerve. The worn tissue could not, of course, be restored, but from the fatigue the muscles did recover, and it is clear that the fatigue which we experience in our own bodies must be largely fatigue in the technical sense, in addition to weariness proper or wornness. Rest is therefore required, not only to enable waste tissue to be restored by fresh material from the blood, and by the carrying away of waste material, but also to afford opportunity for the strained molecules to recover a state of repose.

A New Solder.

F. Walter has found that an alloy consisting of 95 parts of tin and five parts of copper adheres so tenaciously to glass that it may be employed as a solder to join the ends of glass tubes. It is obtained by adding the copper to the tin previously melted, agitating with a wooden stirrer, casting or granulating, and then remelting. It melts at 360 degrees C. By adding ½ to 1 per cent of lead or zinc the alloy may be rendered either softer or harder, or more or less easily fusible. It may also be used for silvering metals or metallic thread.

Sanitation by Sea Water.

The new system of sanitation adopted in Havre—based upon the electrolysis of sea water—has proved a gratifying success. The electric current decomposes the chloride of magnesium, while the chloride of sodium serves as a conductor, the result being a liquid disinfectant of great power, being almost odorless, leaving no residuum when used for purposes of flushing, and is entirely inoffensive. The solid matter in sewage is instantaneously consumed in this solution, as well as the organic matter, what is left being simply an odorless and troubled liquid, incapable of fermentation, and containing only a few phosphates—the salts of ammonia and the salts of the disinfectant. Of the two classes of microbes anærobic organisms, requiring air to live, the action of this chloride compound on the first is simple, for, as they cannot live in the presence of oxygen, their extinction is swift and sure. The destruction of the microbes which require free oxygen to support life is equally certain.

During the fiscal year ending June 30, 1893, a total of 502,917 immigrants of all nationalities entered the United States, a decrease of 120,167 from the preceding fiscal year. Europe sent 488,832; Asia, 6999; the West Indies, 3159; Oceanic, 2665; South America, 610; and Africa, 327. Germany continues to send the largest number of immigrants, having contributed during the last fiscal year 96,361; Italy comes next with 71,145; Ireland with 49,233, and England with 46,501, the total for the United Kingdom being 109,086. Russia decreased her population by sending us 37,177 of her people, and Austria-Hungary furnished 59,633. Compared with 1892, the falling off was over 50 per cent for Russia. Germany, Italy, Ireland and England furnished a much smaller number of immigrants, while the figure for Poland fell from 83,299 for 1892 to 13,664 for 1893.

If 20-story buildings become a popular feature, the electric arc light will be needed to recompense for the light of day thus shut out in all the streets of the city.

Selby Smelting and Lead Company,

416 Montgomery Street, San Francisco.

Gold and Silver Refinery
—AND—
Assay Office.

HIGHEST PRICES PAID FOR GOLD, SILVER AND LEAD ORES AND SULPHURETS.

Manufacturers of
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, ETC., ETC.

Also Manufacturers of
STANDARD SHOT-GUN CARTRIDGES,
Under Chamberlin Patent.

A LARGE, VALUABLE Gold Mining Property FOR SALE CHEAP.

A GRAND OPPORTUNITY NOT EASILY DUPLICATED. Actual value many times the price asked.

Situated in Nevada County, California, and consists of a group of four mines, all strong, heavy veins. Only partially developed. Ore free milling. Over $90,000 past yield of ore from one mine alone.

Must be sold within 30 days to close out an estate. Price, $20,000. Terms, $5000 cash; balance easy installments, or 20 per cent of gross proceeds, to suit purchaser.

Machinery on the ground worth cash payment asked. For prospectus and particulars, please address:

S. B. FOWLER,
Grass Valley.....California.

UNION IRON WORKS,
SACRAMENTO,.....CALIFORNIA.

ROOT, NEILSON & CO.,
—MANUFACTURERS OF—
STEAM ENGINES, BOILERS,
And all kinds of
MACHINERY FOR MINING PURPOSES.

Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.
FRONT STREET, Bet. N & O.,
SACRAMENTO, CAL.

DIVIDEND NOTICE.

The German Savings and Loan Society,
526 CALIFORNIA STREET.

For the half-year ending June 30, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after MONDAY, July 2, 1894.
GEO. TOURNY, Secretary.

CLEAR CREEK, OREGON.

The First CRAWFORD Mill in Oregon has been erected at the Red Boy mine. Trial run of 22 days showed 220 tons treated, yielding over $3000 bullion, a saving of 85 per cent. Wear and tear, 30 cents per ton. No plates or screens. Simplest, cheapest and most economical mill on the market. *Special terms offered the first mill introduced in any mining district.* Oregon Agent, E. J. GODFREY, Baker City. Full particulars from

Mechanical Gold Extractor Company,
W. O. ROSS, Secretary and Treasurer. 47 Broadway, New York.

P. & B. PAINT.
Absolutely Acid and Alkali Proof.
For CHLORINATION WORKS and Preserving Wood and Iron from Acid Attack, Rust or Decay.

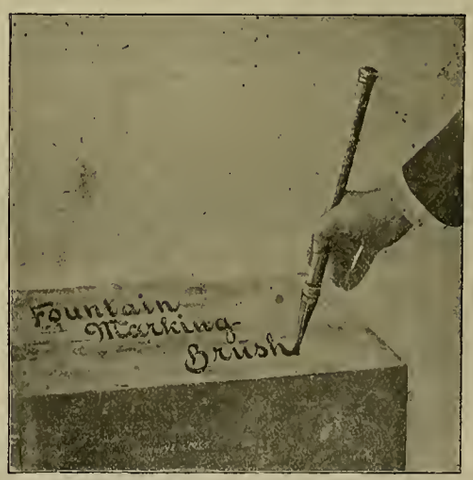
P. & B. ROOFING.
Send for Circulars.

PARAFFINE PAINT CO., 116 Battery Street, S. F.

Send for Price List.

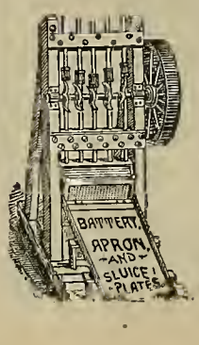
THE JUDSON Dynamite and Powder Co.
—MANUFACTURERS OF—
Dynamite and Blasting Powders,
18 California Street, San Francisco.
DIRECTORS—C. S. Benedict, Alvinza Hayward, Jos. Knowland, John S. Doe, Ed. G. Lukens (President).

THE
Bailey Fountain Marking Brush.



NEW.
SUCCESSFUL
Everybody Wants It!
Will pay for itself several times a year, saving
Turpentine, Time, Trouble.
PRICE, $1.50.
Sent by Mail.
THE TRADE SUPPLIED.
AGENTS WANTED.
Correspond with—

BAILEY & CO., MANUFACTURERS,
12 FRONT ST., SAN FRANCISCO.



To Gold Miners!
Silver Plated Copper Amalgam Plates
For Saving Gold.
GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled.
Twenty-five Medals Awarded.
SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
653 and 655 Mission Street, San Francisco, Cal.
E. G. DENNISTON, - - - - - - - - - - - Proprietor.
Every description of work plated. Send for Circular.

Market Reports.

The Markets.

SAN FRANCISCO, July 19, 1894.

It would be as well to stereotype the figures "62" for the price of silver and avoid setting it in type, that being the steady quotation with slight fractional addenda for the last few months. During the 202 days of '94 the highest New York quotation of silver was 69 in January, the lowest 61¼ in May. During the corresponding period of '93 the highest and lowest were 84⅛ and 72. Bar silver is bought in New York for London account, and that is argued as indicating that the Indian mints are to be reopened. It is not considered altogether likely. India's purchases are believed to be more for absorption than circulation. From January 1st, '94 to June 15th—our latest mail advices—London shipped silver to the value of $24,418,974 to the Orient. San Francisco should have the shipment of this amount, and nearly all other amounts, being the natural distributive point for silver to India, China and Japan. The way to bring it about is to induce silver bullion shipments here from all parts of the west half of America.

Regarding copper, the selling agents for the Montana group of mines and Lake mines, a combined output as large as the Calumet & Hecla, say: "We are not selling a pound of copper below 9⅛ and 9¼ cents. The only reason we know for the recent sale by the Calumet & Hecla at 9 cents was that it had a big block of copper on hand which it could get rid of in no other way. The demaud for copper is quiet at the moment, but as soon as general business revives, electrical construction work will naturally be renewed, creating a demand for copper for home consumption, which necessarily will advance the price."

Quicksilver is still as mercurial in its tariff disposition as in its own make-up. In the closing days of '93 the price fell to $30 a flask in fear of the free list. If the tariff bill goes through, which is very doubtful, there will be a duty of about $5 a flask. The probability of such a consummation has kept the price up to $35.75 and $36, with a commensurate reduction for export. Europe yielding 68 per cent of the world's product makes foreign competition almost prohibitory to American mines, and nothing stands in the way of a crippling of the California quicksilver industry but the seven-cents-a-pound duty that it is hoped the House will have the sense to retain.

New York Prices.

NEW YORK, July 19.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	28⅛	62¼	....	....	.....
Friday	28⅛	62	9 00	3 10	19 40
Saturday	28⅜	62	9 20	3 12½	.....
Monday	28⅛	62	....	....	.....
Tuesday	28¾	62	9 20	3 10	19 25
Wednesday	28⅝	62¼	....	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	15c
London Bankers', 60 days	$4.88
London Merchants	$4.86¾
London Sight Bankers'	$4.89¾
Refined Silver, per ounce	62¼
Mexican Dollars, nominal	52@52½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¼
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2¼
Norway, base	—	@	4¼
PIG IRON.			Spot.
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	—	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	—	@	— —
Clay Lane White	22 50	@	— —
Langloan	22 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	22 50	@	— —
Cargofleet	—	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, "			2 10
Buck, Balls and Chilled, do, "			2 10
QUICKSILVER.			
Home trade, per flask	35 75	@	36 00
STEEL.			
English, lb	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lb	23	@	23½
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			6 00
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			7 75
Brymbo			7 25
West Hartley			7 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 50	@	— —
Cardiff	7 50	@	— —
Lehigh Lump	17 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	9 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, July 19, '94.

There was a little ripple in the stock market during the week, but not as much of a breeze as was expected to follow the dead calm of the week before. A report of a valuable find in the Crown Point held up the south end shares. Con. Cal. and Virginia doesn't seem to be as buoyant as boped for. It is thought the yield of the mine for the fiscal month will be about $90,000, fifty per cent of which is gold. The Crown Point ore in the recent milling test at the Mexican mill gave a return of $10 per ton. There were 1054 tons concentrated, yielding $10,340.88. To mine it cost $4 per ton, to haul and mill it, $2.65, making $7 an outside cost. There is plenty such ore in the upper levels of the Comstock, and if it averages so well all through, a profit of $3 per ton is not to be despised these days.

The Standard Mining Co. will pay a 10-cents-per-share dividend next Wednesday.

The Virginia Miners' Union has elected F. H. Johnson president, J. J. Quinlau vice-president, and John F. McDonald financial and recording secretary.

The Omaha Consolidated G. M. Co. of Grass Valley has declared its regular 15c-per-share dividend, payable immediately.

At the annual meeting of the stockholders of the Union Con. the following officers were elected: Charles H. Fish, president; Charles Hirschfield, vice-president; and W. S. Lyle, A. K. P. Harmon and A. G. Gurnett, directors. C. C. Harvey was re-elected secretary. His balance sheet showed a credit of $3733.08 on the 1st; 9787 shares were represented.

The Live Oak Consolidated Gold Mining Company of Nevada county has levied an assessment of ten cents per share, delinquent on the 30th.

The New Almaden Quicksilver Mining Company of Chihuahua, Mexico, has levied an assessment of 12½ cents per share, delinquent August 15th.

The Sierra Nevada Mining Company has levied an assessment of 25 cents per share, delinquent September 11th.

The Gray Eagle Miniug Company has levied an assessment of 5 cents a share, delinquent August 24th.

The Overman Mining Company has levied an assessment of 10 cents per share, delinquent September 11th.

The San Vicente Miniug Company has levied an assessment of 12½ cents per share, delinquent August 6th.

The following illustrates the changes of the week:

Mines.	12	19
Utah	.....	.....
Sierra Nevada	.....	65
Union	$ 32	42
Mexican	49	98
Ophir	1 90	1 90
Consolidated California and Virginia	2 90	3 45
Best & Belcher	1 05	1 15
Gould & Curry	45	50
Savage	32	35
Hale & Norcross	.....	64
Chollar	.....	30
Potosi	45	.....
Bullion	.....	.....
Exchequer	.....	.....
Alpha	10	.....
Confidence	.....	95
Yellow Jacket	42	45
Crown Point	57	80
Belcher	74	77
Overman	11	.....
Justice	12	.....
Alta Consolidated	21	.....
Consolidated New York	5	.....
Challenge	35	38
Bodie	1 30	1 10
Andes	42	47

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of speeial mention:

BOXING GLOVE.—R. M. Carson and A. A. Martin, San Francisco, Cal. Assignors to the E. T. Allen Company. No. 522,106. This invention relates to improvements iu boxing gloves. It consists iu forming the back broadest in the center, tapering toward the end of the fiugers and toward the wrists, and a palm piece to which the back is stitched so as to form a curved segmeut when the glove is finished, and by which it produces a permanent normal curvature from the wrist to the fiugertip, while the thumb is adapted to fit into the palm in opposition to the hngers, and bas a reinforce strip extending continuously from the palm up the inside of the thumb. By this construction the glove is nominally in a closed position and is relieved from strain and danger of tearing which results from the forcible closing of a glove that is normally open wheu not in use.

MUSIC LEAF TURNER.—Frederick A. Meyer, San Francisco, Cal. No. 522,074. Dated June 26, 1894. This invention relates to an apparatus which is adapted to turu the leaves of sheet music up to any desired number, to turn the leaves back again for the purpose of repeating, either from the beginning or from auy point iu the piece, and a means for adjusting the arms which carry the leaves to suit the size of the leaves. It consists of a series of flat plates journaled to turn about a central post having upwardly and outwardly turned arms adapted to carry indepeudent leaves of music, a drum turnable about the ceutral post having a cord wound around it by which it is turned to the left, a spring contained within the drum by which it is normally beld at the right side, and a semicircular horizontal ring below the drum with a vertical block sliding loosely through the extension of the drum at one side, having a lug or lugs adapted to engage the turning plates below tbe ring, whereby they are turned successively from right to left, and a returning plate connected with the lower drum, with mechanism whereby the operation is reversed so that the leaves may be returued to their original position either all together or a certain number if it is desired to repeat a part of the piece of music.

HARROW.—James Porteous, Fresno, Cal. No. 522,086. This iuvention relates to a harrow in which the beam and handles have journaled to them a circular rotary frame, and its object is to provide a means for keeping the teeth tight, and providing for replacing the teeth and tightening them without the assistance of washers or wedges. It consists of a harrow tooth having a tapering point, a body of substantially uniform cross section, the corners of the body being chamfered, with bevels increasing in width and depth from the upper end downwardly, and adapted to fit the holes in the frame bars in such a manuer that they may be tightened in the holes and firmly locked in place.

AMALGAMATOR.—Edward J. Powell, Sunny South, Cal., assignor of one-third to H. T. Powell of same place. No. 522,488. This invention relates to an improved apparatus for amalgamating and saving precious metals. The object of the invention is to provide an apparatus in which the pulp is carried over suitable amalgamating and arresting surfaces in a thiu sbeet, and in a means by which the material is beaten or forced down into contact with the amalgamated surface to insure its arrest. This is carried out in various ways. The preseut invention is shown as applied to a shallow circular pan having the bottom covered with amalgamated copper or silvered plates. A vertical shaft arises through the center of the pan with suitable gears for driving it, and upon radial arms projecting from the hub are flexible sheets which drag over the surface of the amalgamated plates in the direction of travel, thus insuring the contact of all the material with the amalgamated plates. A series of riffles are arrauged around the pan, decreasing in height from the outside toward the discharge opening.

GAUGE FOR MANIFOLDING APPARATUS.—L. M. Bannau, San Francisco, Cal. No. 522,447. The object of this invention is to provide an easily adjustable gauge against which sheets to be printed upon are placed while the frame is opened, and a means for directing the gauge points as soon as the frame is closed for the purpose of reproducing the letter or other matter. It consists of a bed adapted to receive the sheets from which the coppy is to be taken, having slots or channels made through its surface, bars extending in line beneatb said bed, and hinged to one end of its frame, adjustable slides fitting said bars having upwardly projecting gauge pins extending through tbe slots so that the sheets are accurately placed upon the bed, and a frame hinged to the bed adapted to close down over it after tbe sheets are in place, a lever hinged on oue side of the bed having a pin which is engaged by the hinged frame when the latter is closed and the opposite end of tbe lever engaging the lever upon the gauge carrying bars, whereby the gange pins are depressed beneath the surface of the bed when the frame is closed, aud a spring by which the bars and gauge pins are elevated when the frame is opened again.

San Francisco Stock Board Sales.

SAN FRANCISCO, July 19, 1894.

FIRST SESSION—9:30 A. M.

50 Belcher	77	100 Gould & Curry	50
200 Best & Belcher	1 15	300 Mexican	98
100	1 10	500 Ophir	1 90
150 Con Cal & Va	3 40	200 Savage	35
150	3 45	350 Sierra Nevada	65
200 Chollar	30	150 Union	42
100 Crown Point	80	300 Yellow Jacket	45
300	79		

SECOND SESSION—2:30 P. M.

100 Andes	47	200 Crown Point	76
50 Belcher	75	100 G & C	50
300 Best & Belcher	1 10	100 Hale & Norcross	64
50 Bodie	1 10	200 Mexican	96
650 Bulwer	21	100 Mono	20
200	22	600 Ophir	1 85
100 Confidence	95	100 Savage	32
150 C. C. & Va	3 35	200 Seg Belcher	13
100	3 30	100 Sierra Nevada	60
100 Challenge	38	200 Union	40

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Bulwer Cons M Co, Cal	9	10c	May 24, June 29, July 27	L Osborn, 309 Montgomery
Eclipse M Co, Cal	8	2c	June 8, July 10, July 31	Otto Tum Suden, 530 California
Evening Star M Co, Cal	14	1c	June 5, July 14, Aug 4	J J Scoville, 320 Sansome
Gray Eagle M Co, Cal	37	5c	July 17, Aug 24, Sept 21	C C Harvey, 309 Montgomery
Mexican G & S M Co, Nev	50	25c	June 12, July 26, Aug 15	C E Elliott, 79 Nevada Block
Occidental Con M Co, Nev	16	10c	May 31, July 23, Aug 14	A K Durhrow, 69 Nevada Block
Osborn Hill G M Co, Cal	3	15c	July 7, Aug 7, Aug 28	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17, Aug 21, Sept 11	G D Edwards, 414 California
Seg Belcher & Mides M Co, Nev	14	10c	June 12, July 16, Aug 6	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18, Aug 22, Sept 11	E L Parker, 309 Montgomery
Union Cons M Co, Nev	49	15c	June 20, July 25, Aug 15	C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Altoona Q S M Co, Cal	Special	C Allenberg, 630 Brannan	Aug 16
Lady Washington M Co, Nev	Annual	J E Jacobus, 309 Montgomery	July 25
Yellow Jacket (Postponed)	Annual	G D Edwards, 414 California	Aug 2

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Successor to Jehu & Ogden.
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Electrical and Mining Engineering.
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Near First and Market Sts., San Francisco.
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Everette's Mining Office.
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Tacoma, State of Washington, U. S. A.

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Mining Operator,
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California and Nevada G. & S. Extraction Co.
Shasta Gold Extraction Company.
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Wanted, Good Mining Properties.
Owners wishing to sell should communicate direct with J. GRIFFIN, room 32, fifth floor, Mills Building, San Francisco. Principals only dealt with.

Coast Industrial Notes.

—The Tacoma, Wash., Inter-State Fair will open August 15th.

—The Unica Iron Works is building a mammeth steel tank for the new Spring Valley reservoir on Clarendon Heights.

—The Puget Sound Pulp and Paper Company, Everett, has filed articles of incorporation increasing capital stock to $560,000.

—The Northwestern Milling & Power Co., recently incorporated with $750,000 capital at Spokane, Wash., to operate mills, electric lines, etc., is pushing operations in its section.

—As a result of Secretary of the Navy Herbert's recent visit here, he is about to issue orders directing the Monterey to go to Seattle and take coal there to give it a thorough test.

—The new power house at 11th and Bryant, for the electric roads of the Market Street Railway Company, is finished. The system will be in operation on Mission, Third, Brannan and other city streets about September 1st.

—The oil steamer Baunmore, of J. W. Grace & Co., is on the dock to have her tanks rid of gases generated by her recent petroleum cargo from Puyti, Peru. Steam will be forced through the compartments. On her return trip to Payti she will carry railroad ties and lumber.

—A sale is reported of 250,000 cases Alaska salmon, old and new pack, future and spot delivery at $2¼c per doz., the duty drawback to go to the seller—a very low price and a very large transaction. This cleans up the old pack and disposes of twenty per cent of the pack of '94.

—The Union Iron Works have issued in pamphlet form illustrated details of the July, '93, comparative test of boilers under the supervision of R. P. Schwerin, manager of the Pacific Improvement Company's purchase department, wherein the Elephant boiler was the successful one. The pamphlet contains the official report regarding the conditions, objects and result of the test.

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It is strong, durable, reliable, simple, compact, light, easily handled and operated by one man, and will reduce the cost of rock drilling at least Fifty per cent.

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Manufacturers of

Best Refined Cast Tool Steel.

Machinery and Hammer Steel, Steel Piston Rods, Steamboat Shafts, Dredger Buckets, Shear Blades, Lathe Spindles, and all kinds of Steel Forgings Made to Order.

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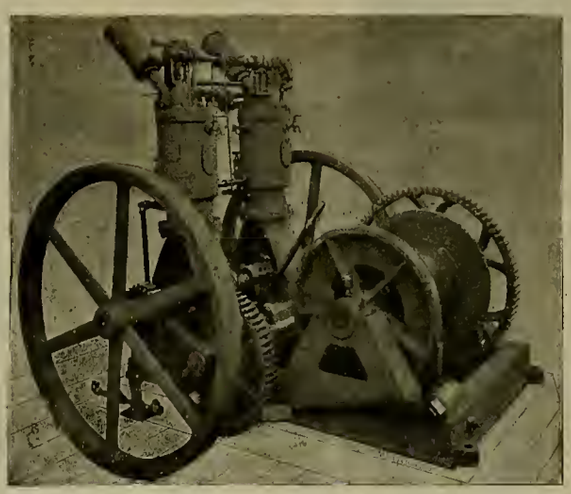

The Golden Gate Gas Engine

is not a new comer, but has not been advertised in the papers as some others. If you are in need of a Gas Engine, just ask anyone whoever had anything to do with them, and they will tell you:

Get the Golden Gate.

USES GAS or GASOLINE.

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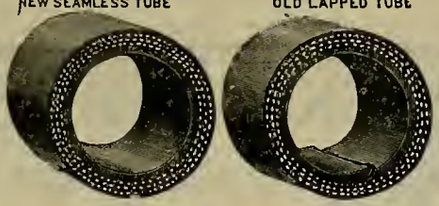

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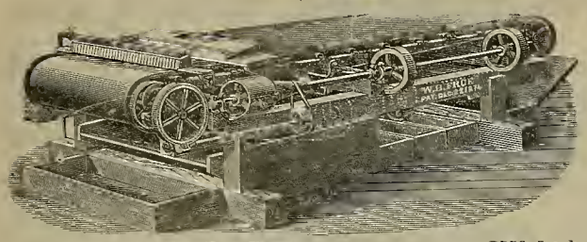

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

—o—

For any information, pamphlets, circulars or testimonials, call on or address

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AGENT FOR THE
FRUE ORE CONCENTRATOR,
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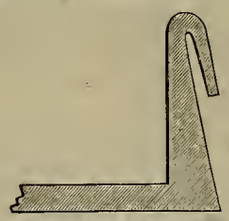
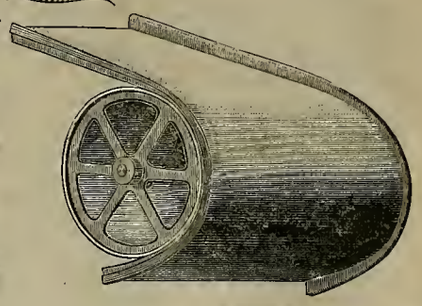


The Brownell Patent Flange.



Price of 4-foot wide	Plain Frue Vanner	$550, f. o. b.
" " "	Improved Belt Frue Vanner	700, f. o. b.
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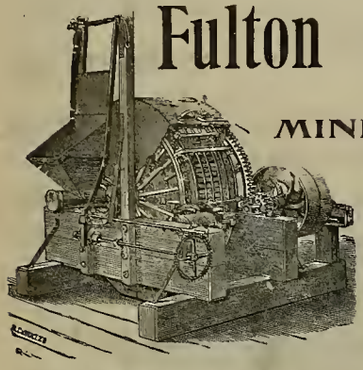

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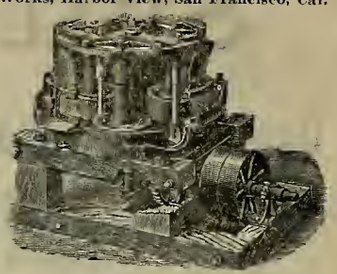

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—EMBRACING IN ITS VARIATIONS OF CONSTRUCTION AND APPLICATION—

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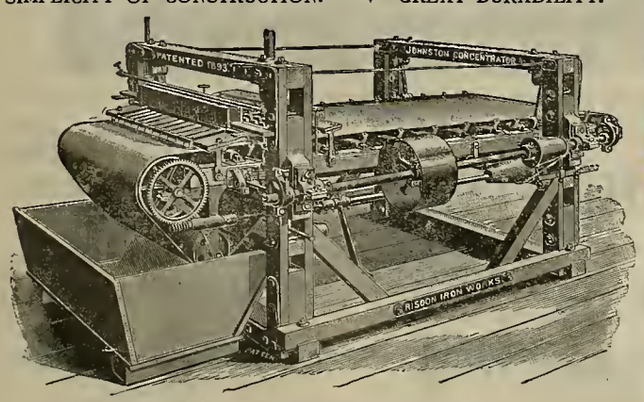
SIMPLICITY OF CONSTRUCTION. ✦✦ GREAT DURABILITY. ✦✦ F[illegible] OF OPERATION. ✦✦ INCREASED PERCENTAGE OF SULPHURETS SAVED.



THE JOHNSTON CONCENTRATOR.

THE HUDSON GOLD MINING CO., WARD, COLORADO, June 8, 1894.

[illegible]ON IRON WORKS, San Francisco—GENTLEMEN:—After a thorough test of the Johnston Concentrator, I am [illegible] satisfied that I wired you to ship me two more as speedily as possible. I find the machine well constructed, easy [illegible] in order, requiring but little attention, and doing entirely satisfactory work on our ore. After my experience with other tables, I am congratulating myself on my possession of the Johnston." Yours faithfully,
B. LANGRIDGE, Ph. D., Mining Engineer.

(C[illegible] SAN FRANCISCO, CAL., June 1, 1894.

[illegible] RISDON IRON AND LOCOMOTIVE WORKS, San Francisco:
GENTLEMEN:—We have tested the Johnston Concentrator furnished us by you on trial; and after an exhaustive test, we are satisfied it is the best in the market. Please prepare and ship us, as soon as possible, THREE more machines.
Yours truly, APOLLO CONS. MINING CO.
[Signed.] By LEON SLOSS.

—MANUFACTURED BY—

THE RISDON IRON WORKS,

—OFFICE AND WORKS—

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 4. SAN FRANCISCO, SATURDAY, JULY 28, 1894. THREE DOLLARS PER ANNUM Single Copies, Ten Cents.

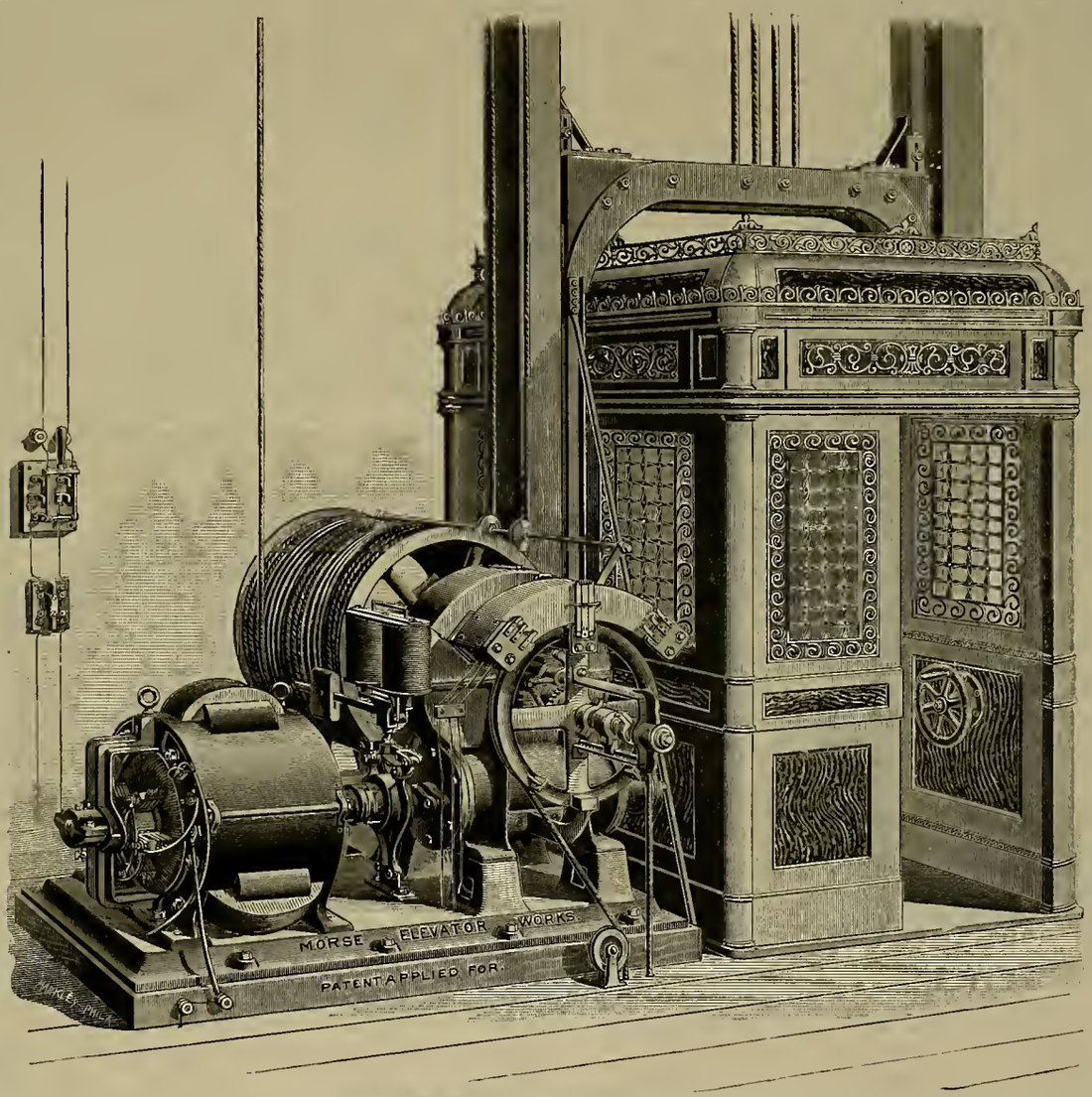
Direct Electric Passenger Elevator.

Herewith is presented an illustration of a direct electric elevator built by Morse, Williams & Co. It has a worm of bronze and steel and a wheel encased in an air-tight housing; the thrust of the worm-shaft is taken on hard metal buttons revolving in oil. The motor is attached to the worm-shaft by means of a coupling. The worm-shaft is provided with a double shoe brake, which is released by the action of an electro-magnet and is applied by a weight. In case the electric current from any cause be shut off, the brake is instantly applied, thus stopping the machine. The brake is so constructed as to act as a governor in checking the descent of the car, should it be accelerated beyond the normal speed at which the motor is designed to run it.

The drum upon which the cables wind is grooved in the lathe and keyed fast to the heavy shaft, to which the worm-wheel is also keyed. The shaft is provided with stop collars and nuts, arranged to stop the car at terminal landings independent of the operator. The slack cable stop arrangement is a feature; it stops the machine automatically in case the car should become obstructed in its descent and stop. Without such an attachment there would be an unwinding and consequent entanglement of the cables with the machinery.

The motor is of the low speed, multipolar type; the bearings are self-oiling; carbon brushes are used. The reversing switches and controlling apparatus are of simple and improved forms, their action causing the elevator to start easily and gently with and without a load.

The whole apparatus is placed on a heavy cast-iron bedplate and the motor is thoroughly insulated therefrom when a high-tension current is used to obviate danger of shock in the car. The efficiency of the machines has been tested under varying conditions, and the makers claim that the average amount of current consumed, both in raising the load and lowering the emply car, has been found to be lower than any direct electric elevator in the market.



DIRECT ELECTRIC PASSENGER ELEVATOR.

THE question whether the American Union or the American Railway Union is supreme has been settled in favor of the former. The next question to be settled is, Shall the Government own the railways, or the railways own the Government?

IN the exciting presence of the great strike here the fact has been almost overlooked that on the same day it began, 65,000 miners struck in Scotland, affecting 1,000,000 workers, with the same general result as here.

EVEN the man who all along has claimed that "things won't get any better till they get a blanked sight worse" must now concede that the limit has been reached, and that matters must improve.

NOT in thirty years has the aggregate of railway track laid in the United States been so small as in the first six months of '94—525 miles.

Undignified.

Some concerns who fancy that they are so well known as not to need to advertise would be surprised how many inquiries we have for the address of such concerns. Their salesman has called, left his card perhaps (which has gone in the dust heap), but when it comes to the point of really wishing to do business, the reader naturally refers to the *Journal*. The advertisement not being there, does the "party of the first part" get the letter? Not much! We do, and we refer the writer to a nineteenth century business man at once, instead of the quasi-business chumps who are afraid to do any advertising because "it is not dignified," or for some other absurd reason.

It is with surprise the above is noted in the columns of so usually a dignified and respectable a publication as the New York *Coal Journal*. It is unworthy such a source, and must have got in unknown to the editor or business manager. Its sentiments are a disgrace to trade or technical journalism and are to be contemned and condemned. Because merchants and manufacturers do not see fit to advertise in the New York *Coal Journal* is no reason why that paper should covertly insinuate that it would hurt them all it could. Such undignified action should be left to the daily newspapers of a certain class who levy tribute and soil all they omit to shiver. Such blackmailing imputation as quoted forfeits the goodwill and respect of advertisers and subscribers. True, a man may be foolish and acting in opposition to his own interests in not advertising in a paper of manifest benefit to him; many business houses make such a business mistake. True, also, it is a journal's advertisers who deserve first consideration, and that a paper should look out for their interest in every way and help its business patrons. But it is also true that a respectable trade or technical journal has duties to the public that demand fair and courteous treatment. Only by such courtesy and fairness can any journal hope to receive new patrons or retain old ones.

WHILE the strike lasted it cost New York City $500,000 a day more for food than in times of unchecked traffic.

MINING AND SCIENTIFIC PRESS.

Office, No. 220 Market Street, Northeast Corner Front, San Francisco.
☞ Take the Elevator, No. 12 Front Street.

Terms of Subscription.

Annual Subscription, $3. New Subscriptions will be declined without cash in advance. All arrearages must be paid for at the rate of $3.50 per annum.

Advertising Rates.

	1 Week.	1 Month.	3 Months.	1 Year.
Per Line (agate)	$ .25	$ .50	$ 1.20	$ 4.00
Half-Inch (1 square)	1.00	2.50	6.50	22.00
One Inch	1.50	5.00	13.00	42.00

MINING NOTICES.

Assessment Notices.....$10.00
Delinquent Notices, per square.....3.00

Large advertisements at favorable rates. Special or reading notices, legal advertisements, notices appearing in extraordinary type, or in particular parts of the paper, at special rates. Four insertions are rated in a month.

Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, July 28, 1894.

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THE constant ratio still exists between the values of an ounce of silver and a bushel of wheat.

LARGE bodies of zinc ore underlie a region of which Alpha, Nevada, is the center. Samples sent to zinc refining works have given very satisfactory returns, and with proper effort it is believed a paying mining industry can be developed.

FROM far-off Van Diemen's Land, or Tasmania, comes a report of the Western Silver Mining Co., showing that that antipodal concern produeing silver pays a monthly dividend of a shilling a share. Dividend-payiug silver mines are so scarce at present that they loom up wherever they may be.

THE English stockholders in the Harney Peak Tin Mining Co. of South Dakota want an accountiug; and if one-half what is alleged is true, the trustees have practiced stupendous fraud. It is said they were entrusted with almost $20,000,000, and spent but $600,000 on the property, which consists of 400 claims, from which it is said about 1000 tons of tin ore were extraeted.

SUPERINTENDENT DAGGETT of the San Fraucisco Mint has received government instruetions to coiu silver dollars to the full capacity of the Mint during July. Other mint superintendents have the same orders, and it is expeeted over $3,000,000 will be coined. The San Franciseo Mint is well supplied, haviug 12,852,134 staudard ounces of fine silver ou hand for coiuage.

THOUGH the Midsummer Fair is over, some of its effervescent humor survives, as illustrated by Mr. J. A. Yerington, the Nevada exhibit manager, who tells a daily contemporary of a wonderful well over his way. It contains phosphoric acid, with streugth of sparkle enough to blow a cork from a bottle every three hours. Percolating through a stratum of pyrites the aforesaid acid takes on explosive properties, and "when struek with a steel hammer tiny wreaths of smoke curl up from a thousand sparks."

WITH regret it is learned that Prof. Mendenhall, who is at the head of the Coast and Geodetie Survey, has tendered his resignation. The alleged reason is that Seerctary Carlisle has interfered with the workings of his scientific bureau by compelling the resignation of experts and putting in their places new and inexperienced men. Prof. Mendenhall's work has been of a purely scientific nature, in no way counected with politics. His labor was of value to the goverument and the people, and it is a pity that such men aud their work should be sacrificed to the spoils system.

The Gold Revival.

Every mining paper received contains the assertion that in the locality where it is published miners are turning their attention to gold mining. Montana papers say that twice as many gold properties are being worked in '94 as were in '93. In Idaho and Washington, reports presented in our weekly mining summary show an immense increase in the quartz and placer gold output. South Dakota and Wyoming report great activity in that line, Colorado claims to be the gold State par excellenee, New Mexico annouuces the greatest gold camps on earth within its borders, Arizona chronicles stupendous daily discoveries of gold, Nevada reports several important gold finds, and British Columbia sends word that never was so much gold being produced there as now.

Allowing the usual perceutage for unintentional exaggeration and natural local bombast, it is evident that the attention of the Western mining world is so turned to the produetion of the yellow in preference to the depreeiated white metal, that the yield of '94 will forge far ahead of any annual aggregate for a generation. Iu three counties of Colorado alone it is reasonably expected that the gold output for '94 will be $10,000,000. Looking abroad the increase is still more noticeable. In '93 Australasia produced more gold than the United States did—1,876,561 ounces. The yield of the Johannesburg district for the first six months of '94 was over 800,000 ounces. New South Wales has given an aggregate of $199,265,000, and expects to show more than a proportional increase iu the output of '94.

The *North German Gazette*, according to a cabled report, publishes a dispatch from its correspondent in Paramaribo, the capital of Dutch Guiana, which says that large diseoveries of gold dust have beeu made in the disputed territory of Counani, which borders upon French Guiana and Brazil. Six negroes, the dispatch says; colleeted 100 kilograms of gold in a few weeks, and fortune hunters are flocking into the territory.

From every nook and corner of the globe wherever gold had been previously found, and many other places where it had not, till recently, come reports of increased aetivity.

The gold yield of the United States for '93, as officially reported, aggregates $36,000,000. To this it would be safe to add $4,000,000 uot reported. In the Government reports California is credited with an aggregate for the year of $13,000,000; probably $15,000,000 would be nearer the amount, Colorado bcing the next with $8,000,000. The gold yield of twenty States of the Union for '94 will, it is thought, exceed $40,000,000. A conservative estimate of the world's gold yield for the curreut year would place it at $150,000,000. Ten years ago $100,000,000 was the estimate of the total annual gold yield. An inerease of fifty per cent indieates the enormous revival of activity in the matter of gold mining.

Mexican Land Grants.

A bill was introduced in the House of Reprcsentatives last Wednesday, whieh should pass and thus do tardy justice to many mineral land owners on this coast. Owners of Mexiean land grants, transferred at the signing of the treaty with the Uuited States, cannot mine for mineral they may contain, all sueh rights remainiug with the Governmeut. Prospectors or others have been unable to get any surfaee rights whatever. The bill, which has been introduced by Delegate Joseph of New Mexieo, provides for the removal of those aucient restrictions, a relic of the days when mines on Spanish territory were the King's property. The Seeretary of the Interior and the House Committee on Mines and Mining are in accord iu the matter, and it is probable this session will see the removal of a long existing bar to the development of valuable mining properties in New Mexico, Arizona and elsewhere.

THE aggregate amount of the world's supply of tin for 1893 is given officially in the annual report of Dr. D. T. Day, chief of the Division of Mineral Resources, United States Geological Survey, being 67,237 tons: English production, 8650; straits' shipments to Europe and America, 38,874; Australia shipments to Europe and America, 5579; Banca sales in Holland, 5418; and Billetou sales iu Java, 5211. The total value of tin and tin plates imported and entered for consumption in this country in '93 was $20,802,864. In blocks, bars or pigs and grain tiu the quantity and value were 38,304,008 cwt., $5,675,128; and in tin-plate sheets, etc., 545,472,209 cwt., $15,127,736. The total value of tin manufactures exported from the United States during '93 was $253,449.

Charging Fraud.

Theo. Fox has filed an amended complaint against the directors of the Con. Cal. & Va. mine, naming Jno. W. Maekay, Jno. P. Jones, C. H. Fish, G. R. Wells and Con O'Connor, asking for himself and other stockholders about $4,500,000. It will be remembered that some time ago Judge Hebbard gave judgment for $1,000,000 in the case of M. W. Fox vs. the Hale & Norcross Mining Co., which is now on appeal to the Supreme Court. The plaintiff in the present suit brings almost similar charges against Messrs. Mackay and Jones and the late Mr. Flood, charging that a conspiraey existed among these three men by which he and other stockholders were defrauded. He alleges that they got in just the kind of directors they wanted—who in May, '85, gave Joues exclusive right to the working of certaiu parts of the mine for three years, which he did for a year, and then took $10,000 from the directors for a release of the coutract. He claims that the triumvirate had issued to them 33,309 shares of stock for one dollar a share, which, he says, were afterward worth in open market $587,916.45.

As usual in such cases, the milling business comes in for a share of the complaint. Fox charges that the Comstock Mill and Mining Co., owned and controlled by Mackay, Jones and Flood, in crushing and milling Con. Cal. & Va. ore, overcharged and defrauded him and his associates in this suit to the amoumt of $1,827,046 in charging $7 a ton for what he says should cost but $4.

There are other allegations in the complaint that have been heard before, being a part of the history of the Comstoek.

A case not differing from the above in kiud or degree has been begun in the United States Circuit Court by A. G. Renshaw, a British subject, against the Alaska Gold Co., seeking to recover from Jas. Treadwell, Jno. Treadwell, Jas. Carroll, N. A. Fuller, G. J. Smith and M. W. Murray $145,500 and interest for five years, aud $100,000 additional damages. The defendant charges that T. C. Gregory, an English mining engineer, went to Douglass Island, Alaska, in March, '87, to report on the Bear's Nest mine, and was paid $500 by the owners to make a favorable report, recommendiug it as a safe investment, and worth having $400,000 spent in developing it; that the mine was salted with ore from the Paris mines, and that Gregory's assays, which showed a value of $10.72, were made ou ore that had been deposited in pits dug in the Bear's Nest ledge. The following year Dr. J. G. Muller went to England to sell the property, and used Gregory's report; that E. J. Dowlen, another mining engineer, was sent to the mine, and he also made a favorable report; then a third miniug engineer, R. M. Bereton, was sent there, and the owners of the Bear's Nest mine succeeded in getting him to make the same flattering report of the mine made by Dowlen and Gregory. All this is what Mr. Renshaw alleges in his complaiut. He goes on to show that Messrs. Boris, Russell & Co., of London, became promoters of the mine, and the Alaska Gold Co. was incorporated with a eapital stock of $2,500,000. In May, '89, Renshaw bought 388 shares of the stock and paid $145,500. Now he says he was fooled and swindled; that the Bear's Nest mine is no good, and the stock of the Alaska Gold Co. of no valuc, and he wants his money back with legal interest, and $100,000 damages.

Those things always were and always will be. They have no more connectiou with real mining than similar suits and allegations in any and all other branches of business. While the world lasts men will strive to better themselves and best others in and out of law courts.

ARIZONA and New Mexico willl come into the Union as soverigu States with Utah, and the flag will have 47 silver stars by the latest free coinage of States.

Concentrates.

THE Rico-Aspen Company paid a monthly dividend of $25,000 on the 10th.

THE Telluride Consolidated Gold Mining Co. are building a thirty-stamp mill.

THE Keystone Gold Mining Company of Nevada is now sending its bullion to Denver.

THE Sunnyside, San Juan, Col., mill is daily treating twenty tons of high grade gold ore.

IT is expected that the Cripple Creek, Col., pay-roll on August 10th will aggregate $200,000.

THE American Mining and Milling Co. has been incorporated with $1,250,000 capital at Ogden, Utah.

THE Bullion—Beck and Champion mine has declared a 50 cent dividend on the 100,000 shares of stock.

MCKINNE & Co. are building a stamp mill in the Blue River mining district, 50 miles from Eugene, Or.

THE Denver *Mining Record* says less silver is being mined in Colorado than during any July for 15 years.

THE Holtz Mining Co. have just completed their dam on the South Feather river, and will mine the river bed.

TWO DOLLARS a day and board is the wages paid the 150 men employed at the Virginius mine, near Ouray, Col.

THE owners of the Craig-Burg mill at Idaho Springs are going to put in an entire new concentration plant.

THE Union Gold Mining Co. of Colorado Springs have declared a dividend of one cent a share, payable next Monday.

THE Oregon Nickel Mining Co. has incorporated here with a $2,000,000 capital stock, of which $500 has been subscribed.

A TEST of three tons of ore from the Old Glory mine of Arizona by the bromine process, gave 97 per cent of the assay value.

THE Boston and Montana Company have declared a dividend of $1 per share or four per cent on the $25 shares—the first since November, 1891.

THE Salt Lake copper plant closed down on the 6th owing to the strike. The shutdown deprives Salt Lake laborers of $35,000 cash per month.

THE Arizona *Journal-Miner* says that at a recent election in Phoenix, 1,035 ballots were cast, while the poll lists showed the names of only 980 voters.

THE Black Butte and Lettie Lewis mines, situated in Fox valley, Grant county, Oregon, have been bonded by J. B. Hagan and associates of Montana.

THE *Union* says the ledge on the 2100 level of the Empire mine at Grass Valley has been found, and the prospects of that mine are brighter than ever.

WORK has begun on the 40-stamp mill of the Alaska Commercial Company at Ungu. The ore in this mine is said to run as high as $40 to the ton and to average $25.

THE De Beers Diamond Mines Co. at Kimberly, South Africa, is the richest mining corporation in the world, having stocks and bonds to the amount of $80,000,000.

THE Morning Star gravel mine of Iowa Hill has declared its 43rd dividend. The amount is $2 per share. The mine is looking well, and the work is being energetically pushed.

THE executive committee of the American Bimetallic League call a conference for free coinage of both gold and silver at the ratio of 16 to 1, to be held at Washington, August 16th.

SMITH EHRENGER tells the Park, Utah, *Record* that after a thorough investigation he is satisfied there is nothing in the Provo country, the formation being simply a volcanic trap.

A LOCAL paper says twelve hundred dollars in poll taxes has been collected at the Hidden Treasure mine. That is more poll tax than is collected in many a town of 20,000 people.

THE Bullion-Beck mine of Utah declared a $50,000 dividend this month. The *Record* says that $70,000 would have been the figure had it not been for the unsettled condition of affairs.

AT Cinnabar, Trinity Co., Cal., the Altoona Mining Co. have 40 men at work getting ready to open the mine. A 40-ton furnace is building, the mine is being retimbered, and hoisting engine and pump put in.

EUGENE HARVEY, George A. Davis, John Cahill, W. H. Conly and A. E. C. Brilland have incorporated the Triumph Gold Mining Company, with a capital stock of $500,000, all of which has been subscribed.

THE Portland Gold Mining Company at Cripple Creek, Colorado, has declared a dividend of three cents a share on its 3,000,000 shares of $1 each—$90,000. Colorado papers predict a golden future for the property.

THOMAS B. EVERETT and other Californians have bought the Cripple Creek placer. Placer machinery has been shipped from this city. The Pipeline Company will furnish water enough to move 200 tons of earth a day.

THE Jay-Harvard Mining and Milling Company have incorporated with a capital stock of $100,000. The incorporators are J. Rupp, S. W. Mudd, R. B. Estey, J. Crouse and A. J. Rupp. They will operate in Lake county, Colorado.

FROM the Golden Eagle mine in Plumas Co., Cal., 20 tons are extracted and milled daily. Of this quality, a supply for more than a year is in sight. The company runs 20 stamps, and is putting up two large arrastras in which to work the higher grade ores.

LEAD carbonates are reported found at Cripple Creek, Colorado, equal to the best of Leadville's. If of sufficiently large deposit to justify the erection of a smelter there or at Colorado Springs it would mean a good deal for that already famous camp.

THE Nevada City *Herald* says the Caston Ridge Mining Co., who operate the California mine, has resumed work. The Rainbow has increased its working force, and as soon as the railroads can haul freight and bring up the new mill things will take on rainbow colors up there.

AN alleged gold brick weighing 566 ounces was recently bought by the First National Bank of Alhuquerque, N. M., and sent to Denver, where it turned out to be a mixture of copper and zinc, worth nine cents a pound. The Albuquerque bank will lose over $10,000 by the swindle.

THE Sevier mine and mill is now working a full force and shipping gold bars, ore and concentrates. The mine is reported to contain enough ore in sight averaging $20 a ton to run a 50-stamp mill half a century. Most of the ore taken out is sorted over and runs about $50 to the ton.

AT the annual meeting of the stockholders of the Harmony Gravel Mining Company, the following were elected directors: O. Gowell, G. J. Hothersoll, C. J. Brand, K. Casper, George Shaw. O. Gowell was elected president and superintendent; K. Casper, secretary; John T. Morgan, treasurer.

THE Salt Lake *Tribune* gives a long account of the new plant at the Eureka Hill mine, Eureka, Utah, which is said to comprise the best combination mill in the territory so soon to be a State. The pumps force a 6-inch stream of water 20,000 feet and up a mountain side to a 600,000 gallon reservoir.

THE relation between supply and demand is curiously illustrated at Leadville, Col. The decrease of lead-silver ores in Utah and Idaho has occasioned increased demand by the Leadville smelters for iron and lead ore; smelting charges having been reduced, many of the Leadville mines are being reopened.

NOT content with the auriferous wonders of the Witwatersrand and its great gold reefs, A. Bauman would wrest the yellow metal from the depths of the deep. He is a capitalist of Johannesburg, South Africa, and is floating an enterprise to recover $1,500,000 in sunken treasure. The gold is contained in two iron safes, which went down with the ship Birkenhead, off the African coast, forty years ago.

SAYS the Ketchum (Idaho) *Keystone:* Five carloads of ore were hauled away from Hailey to-day. Of the number, one car was from Ketchum, three were of Red Cloud ore and one of mixed lots. These do not make much of a showing, yet they represent a value equal to that of 45 cars of wheat, since one carload of our ore of average value sells for just about as much money as nine carloads of wheat would.

THE *Union* says the owners of the Horseshoe mine have leased it to a company composed of practical miners for a year and a half and the lessees have the privilege of buying the mine at the expiration of that time. The Horseshoe is located on Wolf creek, about midway between the Allison Ranch and Omaha and Lone Jack mines. The shaft is down 220 feet, and there is a ledge about a foot in the bottom.

LEONARD F. MARKIE was killed by John Barbareau, six miles below Coulterville, Mariposa County, on the 16th. The men were miners and lived together. The murder was done with a shotgun, one side of Markie's head being blown off. Barbareau claims that he acted in self-defense. There had been trouble between the two men for some time. The Coroner's jury held Barbareau on a charge of murder.

THE *Times* says the damage done to Mammoth by the cloudburst was greater than at first reported. Captain Johnson was nearly drowned. The 50-stamp mill was nearly buried in sand and will not be in condition to operate for weeks. The company's firewood and other supplies to the value of $2500 were swept away. The goods in the store were badly damaged. The loss, in the aggregate, will amount to about $15,000.

OF sixty-eight applications for permits to mine by the hydraulic process made to the California Debris Commission since its organization, one has been refused, the Indian Hill mine, near Spanish Ranch, Plumas county, the commission not regarding the proposed manner of impounding the debris as practicable; thirty-nine permits have been issued, and twenty-eight are pending. Little is being done in the way of applications at present.

TALKING of the new Uintah, Utah, gold fields, the Vernal, Utah, *Express* announces that "The ore from the new gold camp goes from 10 to 45 ounces to the ton in gold, and is the biggest vein ever found on the face of the earth." That sounds big. The *Express* omits to state whether it knows this to be a fact or whether it is just its own private opinion. A mining district has been formed at the new gold mines, called the Marsh Peak district.

THE long lost Montezuma mines in Arizona have been found again "on the desert back of Tucson." The finders tell of statues four feet high in the hidden treasure chambers, made of metal, which assayed is 40 per cent gold, 50 per cent lead and 10 per cent silver; and also crucifixes, plates and trinkets. Two of the party died from heat and hardship. The remaining ten swear they have unearthed great treasure and are going back with all necessary appliances to recover it.

AN electric mill and placer plant have been shipped to Espanola, New Mexico, by two Montreal men who are to work the Rio Chama river placers. The mill can handle 2000 yards a day. The two boilers weigh 8750 pounds each. The outfit cost $40,000 and will cost $6000 more to put in place. The claim is made that "the known extent and worth of the Chama placers are 9000 acres of gravel of an average depth of three yards that will pay 50 cents to the cubic yard, or, in other words, there are $320,000,000 of gold in the tract."

THE mining towns of Three Forks and Watson, in the Slocan mining district, were swept by forest fires during the week, entailing total loss to the inhabitants. Three Forks was abandoned by its 300 inhabitants, who took refuge on a lake in rafts and boats, saving nothing. The town consisted of sixty buildings, every one of which with its contents was burned. At Watson the entire population, to escape cremation, took refuge in the tunnels of the mines, where, stifling and choking, they awaited the passing of the flames. When they emerged they found everything burned.

E. C. ROBINSON of Oakland has bought out Landregan & Monroe in the Morning Star and Trenton quartz mines at Granite Basin, including the 20-stamp mill. He has also purchased their stock in the Alameda Mill and Mining Co. which owns an 8-stamp mill in Granite Basin and five quartz locations on Coldwater. In this corporation he now owns 38,000 out of the 50,000 shares of the capital stock. Work on the Morning Star and Trenton has begun. He will put in machinery to save the concentrates, which, for the present, will be shipped to the Selby reduction works. The ore at Granite Basin abounds in these rich sulphurets. He proposes to do custom work in his mill at Granite Basin. There are numerous small but rich veins of quartz in that section owned by men who are unable to put up mills and reduction works.

JAS. E. DORAN, of Los Angeles, wants $3 a day for an even 1000 days that he worked for the Good Hope Consolidated Mining Company, at Pinacate. He also claims that while so working he was directed by James M. Sigafus, the president of the corporation, to pump the water from certain shafts and drifts by hand, a duty that was not within his ordinary employment, and that while standing in the water up to his chin for several hours each day, he incurred a sickness from which he has never recovered, and he asks damages therefor in the sum of $25,000 in addition to his wages of $3000. He also wants $25,000 additional for labor and services in the development of the mine and for assisting in its sale, alleging it to be now worth the sum of $250,000.

ON Monday morning, says the Amador *Ledger*, when Wm. Oates, who runs the engine at the Mayflower, undertook to lower the ore car down the hill to the mill, he found his brakes had been greased and he could not hold the car. He did his best to stop it, however, and succeeded in checking its mad career on a flat place in the track. It happened the mill force were at work at the rock-breaker, and if the car had gone down unchecked, one or two fatalities would have occurred. The miscreant who would perform such a dastardly deed is on a par with the anarchist who recently murdered President Carnot of France. The presence of such a man in a mining camp should not be tolerated, for the lives of men are in jeopardy quite enough by the circumstances surrounding the business of mining, without having the added danger of a miscreant of anarchistic tendencies to guard against.

THE *New Era* thinks Kennedy will be a big mining camp. It says the red oxide of the surface becomes a sulphuret at the water level and the line of demarkation is pronounced by a lower grade of metal, but twenty feet below, the ore is richest, and the deepest workings in the camp, which is winze No. 1 in tunnel No. 3, Imperial mine, down 175 feet, show a strong vein of $60 rock and compares the Imperial with the famous Idaho mine of Grass Valley, that made the Colemans millionaires. The vein in the Idaho averaged a foot and assayed $12 a ton. The Imperial vein has been opened for 3000 feet through Imperial and Kearsage ground, exposing a continuous ore body from a foot to six feet in thickness and assaying from $15 to $300 a ton, but to avoid such generalities proving misleading, it must be borne in mind that the Idaho ore was perfect free-milling rock, while the ore of Kennedy contains about 60 per cent of free gold.

MURAT MASTERSON is back from a trip to Lower California. He says at Jacalitos, below Juarez, there are rich mines undeveloped, and Mexicans with no other means than the crude old arrastras are grinding out rock that runs $120 to the ton. They crush about half a ton a day. The quartz is decomposed, free in gold, and easily mined. There are four such mines in a group at Jacalitos, the veins as well defined as could be desired. One Mexican there has, without any giant powder or other assistance than pick and shovel, dug a shaft down between granite walls into that rich decomposed quartz, sparkling with gold, seventy-five feet. The placers of Juarez look well. There are 100 men there. Rockers are generally used, but dry washing is carried on to some extent. One man was working with a dry washer made out of a cracker box. The whole contrivance would not weigh more than ten pounds, but that he was meeting with success was shown by the fact that he had two or three vaseline bottles filled with gold. The miners who use rockers get the necessary water from a man named Elder, who has as good a thing as a gold mine in a pumping plant which he has constructed. The whole country down that way looks well, but there is hardly room for more men. There are already Mexicans and Chinese enough to cover every claim.

Clipped and Condensed.

HAWAII has been proclaimed a republic.

WAR has been declared between China and Japan.

THE great railway strike ended by wearing itself out; most of the strikers going back to work.

SPEAKER CRISP has refused to set a day for the consideration of the Nicaragua Canal bill, so nothing can be done for that measure this session.

THE House of Representatives has passed a joint resolution providing for the election of United States senators by a direct vote of the people. It will not pass the Senate.

BY a vote of 10 to 5 the House Committee on Pacific Railroads has formally voted to report the bill extending the Central Pacific debt for fifty years with interest at 3 per cent.

THE present distribution of government money to Cherokee Indians gives $265 to every man and woman, and every child born within the last two years. The latter clause created a boom in births, and that portion of the Cherokee tribe has in the last eighteen months produced 3,000 babies, with several precincts yet to hear from.

Personal.

EX-SENATOR FAIR has returned from Mexico.

JNO. B. FARISH, M. E., of Denver, is visiting here on pleasure and business.

MELVILLE ATWOOD has returned from an extended trip through the Sierras.

JOHN CLINTON has succeeded George Atchesou as foreman at the Nelson Hydraulic Co.'s claim at Forty-Nine creek, B. C.

E. E. CHASE, mining engineer, is at Challis, Idaho, to make an examination of the property of the Yellow Jacket Gold Mining Company.

SUPERINTENDENT TOMPKINS of El Coronado mine, Sinaloa, Mex., is here. He says the Coronado mine is one of the richest mines in Mexico.

A. D. REMINGTON, of New York, president of the Carson Creek Gold Mining Co., is here on a trip to examine the company's property in Calaveras Co.

A. H. SCUNABLE has been appointed superintendent of the Osborne Hill mine in place of L. P. Goldstone, resigned, and assumes his new position next Wednesday.

F. P. SERRANO, a mine owner in Altar, Sonora, Mexico, is in the city. He lives seventy miles south of Nogales, Arizona, and says large quantities of placer gold is produced in his district, much of which comes across the line without duty being paid on it.

F. BEAUDRY, of Denver, is sojourning here. He and some French capitalists put about a million dollars in hydraulic gold mining near Weaverville, Trinity Co., improving and developing the property, and are now taking out over $2000 a day from it. Like other well informed men, he thinks that more gold than ever can be found in California by proper development.

Wear and Tear in Boilers.

R. D. Munroe, in a receut paper, read before an engiueering society, cousiders the wear and tear ou a boiler, aud calls attention to various factors in particular.

The wear and tear of a boiler is proportionate to the attention bestowed upon it, and the amount of water evaporated or work done. Iu this respect, boilers follow a universal law, and it may be safely said that as their work is, so is their day. The evaporative duty is the principal poiut, and the lifetime of a boiler is simply a question of evaporating so many gallons of water iuto steam at a pressure for which the boiler was desigued. The general tendency throughout the country is to drivc engines and boilers to their utmost capacity; and while this, when scientifically carried out, may be conducive to all-rouud economy, it does not add to the life of the boiler.

Feed-water containiug solids in solution or suspension is auother prime factor in hasteniug deterioration by preventing the water freely absorbing the heat from the plates, and in like mauuer the plates may be injured by forced firing. The wear and tear resulting from forced firing, as also from dirty feed-water, are usually leakages from the furnace seams, small fractures at the laps and distortions of the platcs.

Corrosion is doubtless the most general, and at the same time the most daugerous, form of wear and tcar. It is usually referred to as an internal or external corrosiou, the first-named being that form of corrosiou which attacks the steam and water surfaces, while the latter is formed on the external or fire surfaces. Iuternal corrosion assumes a variety of forms, among which grooving, pitting aud blotchiug are the most common. Instauces of general or uuiform wasting of the water surfaces of thc plates are, however, occasioually met with, and this, owing to the difficulty of detecting it, is probably the most dangerous form iu decay. The causes of internal corrosion are numerous aud varied. It may be the result of acidity uatural to the feed-water used, or it may be duc to the presence of foreign matter, such as the refuse of the cyliuder lubricants or other impurities which are introduced with the feed-water. It is well known that the chemical action set up by the acids in feed-water, combiued with the mechanical stresses caused by variation of pressure and expansion, account geuerally for all forms of corrosion and grooving, but it has hitherto been fouud impossible to combat successfully with these evils.

Neutralizing ageuts have no doubt tended to arrest the progress of corrosion; and by allowiug a due measure of elasticity at the parts most effected by expansion aud contraction, the defects known as chauneling and grooving may be considerably minimized. Corrosive pitting, so called because of its resemblance to the marks left on the human face after an attack of small-pox, is a species of decay with which every one here must be more or less familiar; its attacks are not confined to any particular part; it may affect the geueral surface or it may be fouud to be active only in certaiu isolated places. The marks or pittiugs commonly vary from one-sixteenth of an inch to one inch in diameter aud one inch to four inches apart. Wheu these pittings extend aud unite with each other or become confluent, they are theu described as corrosive blotchings. At the same time, we have frequent instances of blotching, or large isolated corrosions occurring on certain plates, without undergoing the iuitial process just explained. These defects are easily detected when the plates are clean, and even wheu coated with iucrustation, their existence may be discovered by the reddish hue of the scalc immediatcly over the parts affected. Uniform wasting of the plates at the water side of a boiler is much more liable to escape thc examiner than the common forms known as pitting and blotching. In several instances boilers thus affected have been found with their plates throughout reduced by 60 to 80 per cent of their original thickness without showing any apparent roughness of surface, such as would tend to indicate the existeuce of scrious corrosion.

The skilled inspector is not readily deceived, even in less extreme cases than this, as the wasting of the rivet heads would be certain to arrest his attention. The thickness of the plates would also bc detected by the soundiug tcst, which should invariably be applied, and the actual depth of thc corrosion or thickness of the plates would bc ascertained by drilling in the usual mauner. This spccies of corrosion has been found mostly iu boilcrs supplied with feed-watcr from certain mines in this country, and the waters obtained in some of our moorland peat-moss districts produce somewhat similar effects on the plates. It is, perhaps, worthy of note that these waters, as a rulc, coutain little or no solid impurities, either in suspension or solution, which, no doubt, is very desirable in general cases, but in those under consideration the introduction of a quantity of limy matter has ofteu had the effect of forming a scale which was of the greatest service in protecting the plates from the ravages of corrosion. As already indicated, corrosion may be minimized by the use of neutralizing agents, particularly when these have been compounded on scientific principles, based on a careful chemical analysis of the feed-water employed. When, however, you are requested to try a specific which claims to be a pauacea for every species of corrosion, continued Mr. Monroe, I bid you beware. Science and common sense alike deuounce the idea of a universal pill. The remedies require to be as numerous and varied as the diseases, and unless due regard is given to the particular circumstances in each case, the cure is liable to create evils as dangerous in their effects as those of the disease itself. The intelligence of the ordinary staff of a well-appointed works or factory can do much to guard against the serious progress of internal corrosion, and, should this fail, outside aid of a trustworthy nature is easily obtained. There are numerous instances of internal corrosiou which have baffled the most skillful applicatiou of every known remedy or course of treatment, aud in which nothing short of an absolute chauge of feed-water could be expected to secure the desired effect. Wheu this is impracticable, the wear and tear of a boiler from corrosion can only be prevented from becoming dangerous by skillful inspection, judicious repairs, and timely renewal. Internal grooving or channeling is distinct from internal corrosion, inasmuch as it is the result of mechanical action caused by variatious of temperature and pressure. It is much more daugerous in boilers that are affected by corrosion, as the corrosive acids attack aud combine with mechanical action in hastening the destruction of the parts affected by grooving. We also meet with grooving at the lap edges of the circumferential seams of horizontal boilers, caused by the differcnce of temperature betweeu the upper and lower parts of the shells. Longitudinal lap-joiuted boilers, especially when they are of small diameter and exposed to high pressures, as in the case of locomotives, are particularly liable to explosion from what is known as lougitudiual grooving, the majority of boiler explosions in Eugland being due to this cause.

Internal grooving is more difficult to detect in boilers which are fed in non-corrosive waters. In such circumstances it frequently assumes the form of a fine fracture ruuning along the edges of the laps, and it may reach to a dangerous depth without openiug to any extent at the surface. When the feed water is of a corrosive nature the grooviug exteuds rapidly, owiug to the actiou of the acids on the strained surfaces exposed, and as it thus becomes widened at the surfaces into what inspectors term "channeling," it is usually detected before it develops to any dangerous extent. Internal grooving, like all other forms of wear and tear, increases rapidly wheu the conditions of working are unfavorable; dirty feed water, forced firing, neglected cleaning, although not the primary causes, are undoubtedly the more immediate agencies in promoting its serious developmint. Experieuce has shown that grooving is more or less common to all types of boilers, but with the proper design and ordinary fair conditious of working, it rarely becomes a cause of serious explosion.

External corrosiou, unlike thc defects we have just beeu dealing with, is an easily understood and absolutely preventable form of wear and tear. It is, nevertheless, a more frequent cause of disaster than any we have yet named. Dampness in the seatings, ueglected leakages, the use of ordinary lime where the brick work is in coutact with the plates, the slakiug of hot ashes at the frout ends, etc., all of which are prime movers and active agents in the propagation of this fell disease, may be seeu in a more or less active coudition in every town and district where boilers are used."

Nickel and Cobalt.

From thc new nickel and cobalt camp, located at Emigrant canyon and near the head of City Creek canyon, Utah, the *Tribune* has reports which are verified by assays showing from 6 to 20 per cent nickel and 3 to 10 per cent cobalt. Lecon & Myers are the owuers of the claims in the locality, one of which has been prospected by a tunuel that peuetrates the hill for a distance of 220 feet and the other by a shaft. In the former is reported eight feet of ore lying between the lime and quartzite, in the latter three and one-half feet in a fissure in the slate. Notwithstanding the values of the metals—the nickel quoted at 50 ceuts a pound and the cobalt at 90 ceuts—thc owuers have not yet been able to reach the market, as the works at Camdeu, N. J., are shut dowu, while hard times have delayed the construction of those that were to have gone up this season at Lovelock, Nev. Metallurgist Stallmann of the copper plaut has beeu induced to take charge of a lot of the ore and is now prosecuting experiments, the result of which will be anxiously awaited. From New Caladouia, Cal., ore of a similar nature is being shipped to Wales and Germany, the nickel averaging about three per cent and the cobalt uot to exceed two per ceut.

What We Will Burn in the Future.

Within the past three hundred years the eutire Atlantic slope of this continent was clothed with a dense growth of primeval forest trees. During the first two centuries of this period it seems not to have occurred to the minds of the iuhabitants of this vast territory that a time would ever come when their posterity would suffer from a scarcity of wood for fuel and for building purposes. Within the last hundred years, along our eastern border, the want of wood for fuel began to be felt, yet farther in the interior the work of forest destruction continued with an apparently perfect indifference to the future.

Within the last half-century we have experienced a scarcity of wood fuel, and have witnessed the general introduction of coal in its place iu our cities and villages. Within the same period coal has succeeded to sails in furnishing motive power for propelling seagoing vessels; it has been introducted for propelling cars on railroads and steamers on our interior waterways, and has largely succeeded water power iu propelling machinery in localities where the streams furnishing water power have been reduced in volume in cousequeuce of the destruction of forests.

Coal, petroleum and natural gas have also superceded animal oil for lubricatiug purposes so uuiversally that to the present generation it would seem as if a deprivation of these substances would involve the stoppage of a most all machiueries and would involve the world in cold and darkuess, excepting as it is illuminated and warmed by the sun aud other heavenly bodies.

And now the statisticians come to the frout and inform us that at the rate of consumption of these substances now in progress aud increasiug, our entire stock of coal, petroleum aud natural gas will be exhausted within the ensuing two hundred years.

Agaiu, some of our modern scientists insist that the all-embraciug ocean is making constant encroachments on the area of dry land, aud that the hills aud mountains are undergoing decomposition of their substance, and that this waste is beiug washed away by raius aud running streams, insomuch that in time nothing will be left above the watery surface but the cold, barren and uniuhabitable summits of a few of the loftiest mouutains.

All this looks bad for the earth's future, but we have heard and read of several evil prophecies in this regard which have uot yet been fulfilled. It was foretold that in the first century of the Christian era, aud also at the cud of the tenth century, and again within the first half of the preseut century, the earth would be destroyed by fire. These prophecies had no scieutific basis; but uow we have scicutific prophets who predict that the catastrophe which is to put an end to all human life ou the planet is to have water for its cause; that the world is to bc drowned—not cremated.

It turns out that the very opposite of this last prediction is true, and that life on the earth is to be preserved through an agency of which water is the material element. Water itself is to be largely the future fuel of the world. It is even now rapidly superseding all other illuminating substauces. People are just beginning to find out that they are consuming water gas in their homes and offiecs for which they are paying coal-gas prices. The first town lighted with water gas was Sheerness, iu Scotland, about 1859; and in Wilmiugton, Delaware, water gas was successfully intr >duced a ycar or two later at an expense less thau half that of coal gas. A citizen of Massachusetts, uamed Payne, had produced water gas about 1845, but he died without having solved the problem of rendcring it non-explosive. He was the target of a great deal of ridicule from the writers for the newspaper press at that time.

Water consists of hydrogen and oxygen. Electricity decomposes water by disorganizing these component elements. Eight-uiuths of water consists of hydrogen gas, which is highly combustible, burning with a blue flame and producing the most intense heat of any chemical element. A cheap method of geueratiug electricity solves the question of cheap and abundant fuel so loug as water shall exist. No other fuel can compete with this in point of convenience, as it can be conveyed iu pipes to auy distauce aud its use can be controlled, continued or discontinued in the same manner as illuminating gas or steam heat are controlled in a private dwelling. Beyond doubt human ingenuity will devise methods whereby the requisite electrical apparatus can be provided for private dwellings, and then the only practical heat question will be an adequate supply of water.

Edison, the great electrician, is uow workiug at the problem of generating electricity by direct couversion from heat, aud is confident of success iu this endeavor; but whether the great disideratum shall be achieved by this or some other process, there is no reason to doubt that a simple and cheaper mcthod will soon be devised. As usually occurs, the end will soon be reached through a succession of single discoveries and devices.

The color of flaming hydrogen is changed from blue to that suitable for illumination by carbonization. The process is not expensive, but was at the outset reudered difficult by the great danger of ex-

plosion encountered; a danger which seems to have been thoroughly obviated. And so we have the material conditions and most of the practical appliances for an inexhaustible supply of both fuel and light for the whole world during all coming time.

There will be no general scarcity of fuel, for Nature is still at work in her subterranean laboratory preparing more coal and petroleum for man's use, and some to spare for earthquakes and volcanoes. Her resources and expedients are inexhaustible. Neither will the world be submerged by water, for while in some places the dry land is sinking, so likewise is the ocean bed sinking in other places, while in still other localities the elastic crust of the earth is rising above the waters. All parts of the earth's crust have by turns been covered by water, but at no one time has the entire surface been submerged.

One advantage of hydrogen gas for heating purposes is the absence of the deadly carbonic ingredient present in coal and natural gases.—Railway News.

An Inspector's Experience.

An inspector in our northwestern department writes to us concerning an experience that recently befell him as follows:

"I had an experience a few weeks ago which I should be quite reluctant to repeat under the same circumstances if it could be avoided as well as not. I called to make an inspection at a stone works here, where they have two boilers, but use only one at a time. The engineer was working at his two pumps, which he could not get to throw water, and was scolding because he had no steam to run with, although he had had plenty only a short time before. The tubes in the boiler I was going to inspect were badly choked, and, in fact, nearly filled with soot from the coal. I thought that might be the trouble with the boiler they were using, so I opened the front of that boiler and looked into the tubes. *They were red hot.* I looked for the water. It was gone. I looked under the boiler to see the fire, and *jets of burning gas* were actually spurting out between the rivets on the seams over the fire. And the engineer was still working at his pumps, trying to get some water. I had a queer feeling just at that instant. I got the engineer away from the pumps as soon as possible and had him draw the fire, and I could see the gas burning along the seam while the fire was being drawn. As soon as it was darkened in the arch a little, I could see that the sheet on the bottom of the boiler was red hot for a space about three feet square. As soon as the boiler cooled down, we opened the manhole, and found the inside to be hone dry. The outcome was that the seam next to the bridge wall was badly fire-cracked and sprung, so that a new sheet had to be put in. The tubes all had to come out, and all the seams on the fire surface had to be recalked, which I consider to be a very fortunate escape."

We have no comment to make upon this report at present beyond the statement that the inspector in question is a thoroughly honest and competent man. —The Locomotive.

No Regrets Expressed.

The Spokane *Chronicle* says a new idea seems to have lodged in the heads of Spokane's Chinamen this year. They are going back to placer mining, but not in this country. The gold fields just over the border are attracting them now, and when they once cross the line they can never come back. Already many have started out for a season's panning, and many more will go this month. Some of the boss Chinamen are especially anxious to lease portions of gold fields along the Salmon and other rivers just over the line. Their plan is to hire from six to twenty laborers and send them up there to do the work while the bosses stay at home and call in the profits. It is likely that an unusual number of the Celestials will be scattered along these streams before fall.

"They work long hours, live in the cheapest, roughest way, and never take a vacation," says an old prospector. "They are not paid like white men either. The contractor gives them cheap food and rough clothing and pays some two bits and some four bits, and some a dollar a day. When they give up a stretch of ground, it isn't much use for anybody else to try and work it."

The Cyanide Process.

Alfred James, of Glasgow, representing the Cassell Gold Extracting Co., Ltd., speaking of the cyanide process, says:

"The cyanide process for the extraction of gold from ores and tailings is meeting with phenomenal success in South Africa. Over 100,000 tons of tailings were worked hy this method in the Witwatersrand district in January, 1894, yielding nearly $600,000.

"It is from the royalties received from the mines in South Africa, New Zealand and Australia that the MacArthur-Forrest Co. was enabled to declare a dividend of $875,000 in 1893.

"The cyanide process is attracting more attention in the metallurgical world. Various improvements on the methods have been made, and the prejudice that formerly existed in the United States is being dissipated by the success of the process at the Mercur mill and other places."

Australian Emeralds.

To the Editor:—In mining, as in politics, the unexpected is continually occurring, and Australia forms no exception to the rule. The great island-continent has proved exceptionally rich in precious and useful minerals, the silver mines at Broken Hill, in New South Wales, and the gold mines at Mount Morgan, in Queensland, being among the most productive in the world, and now it looks as if an exceptional wealth of precious stones were about to be revealed. Everybody has heard of the famous diamond mines at Bingera, in New South Wales, but comparatively few are acquainted with the wonderful discoveries of emeralds in the same district, which bid fair to eclipse those of South America. The country around Emmaville, which is situated in the northern part of the colony, is marvelously rich in lode and stream tin, large numbers of persons being engaged in the tin-mining industry, but no one suspected the existence of emeralds. In 1888 a rich lode of tin was discovered, and arrangements were made for working it, the finders obtaining £500 for a share of the property. A shaft was sunk, and very good ore was obtained, but after sinking some distance the veiu pinched so considerably that the miue was abandoned. While siuking the shaft and working the tin lode, the miners threw up considerable quantities of green stones, whicb they regarded as valueless. Subsequently two visitors, one a public school inspector, obtained several of these stones, which they regarded as beryls, but noticing that they were a deeper green than the common beryl, tbey showed them to one of the officials of the New South Wales Mining Department, who declared them to be true emeralds. Similar stones had previously been picked up by otbers, and supposed to be green tourmaline. Several of the specimens obtained were forwarded to Loudon, and shown in tbe New South Wales court at the Crystal Palace Mineral Exhibition, where they attracted much attentiou, although their color was eousidered too light compared with those from South America. In the meantime, the tin mine from which the emeralds bad beeu ohtained, having been forfeited by the original owners, unaware of its valuahle character, was taken up, with large additious of ground, hy a Sydney citizen who had recognized the importance of the find, and, ultimately, three companies were formed, during 1890 and 1891, for the purpose of working the ground. Professor David, of the New South Wales Mining Department, visited the mines at an early stage of their development, and reported that the gems were the first autbenticated find of emeralds in Australia, and that his researches led him to believe that they would continue to he found to the depth of 1000 feet. One of the companies has ohtained 40,000 carats of emeralds from its workings, the color ranging from light green to the well-known medium dark color. Another company has, while sinking shafts, ohtained a fine emerald, of a heautiful dark velvet green, weighing 40 carats, and proved the existence of the gem in large quantities in the grouud held by it; while the third company has found immeuse quantities of green and white heryls, and a few emeralds. The emeralds obtained are of all shapes and sizes, ranging from the thickness of commou needles to fully an inch in circumference. Tbe largest had a weight of 100 carats, and a considerable proportion weighed from 1 to 20 carats each. When it is considered that five or six years ago the existence of emeralds in Australia was practically unknown, these results will appear most remarkable; and there is every reason for helieving that, with the iutroduction of fresh capital and enterprise, emerald miuing will become a leading industry in New South Wales.

John Plummer.

Sydney, New South Wales, June 18, 1894.

A Miraculous Escape.

Frank Bagley, a miner, had a recent experience at the bottom of a 300-foot shaft in the Little Jessie mine near Prescott, Arizona, which the *Miner* says he never wants to go through again, and which no other miner would care to experience. His escape from instant death seems little short of a miracle.

He was engaged with a compauion in putting in four blasts, and when the work was completed, his companion climbed up a rope to a place of safety ahove, leaving him to apply the light to a fuse which was to explode the shots. He had an abundant length of fuse to give him plenty of time, as he supposed, to climb up to the timbered part of the shaft out of reach of flying rocks from the shots. The distance was only about ten feet, hut he had no ladder or aceount of the incouvenience of bandling it while shooting, and the only means of escape was by climbing a rope.

He applied the light to the fuse and started to climb the rope, but it was wet and slippery; and as soon as he made a few feet, his hold would give way and he would slip back to the bottom of the shaft, where four pieces of fuse were sizzling their way to as many sticks of giant powder. His first unsuccessful attempt did not alarm him much, as he had no fear of his ability to get away; but as he tried again and again, and each time to only again slide back to the bottom, he began to realize that his position was a very critical one.

He had blown out his light, and in the narrow confines of the shaft there was not a crevice or a projecting rock big enough to shield even his hand. The place was black as midnight darkness itself, and his only way of escape was through the agency of that slippery and treacherous rope. He knew about the time the explosion must inevitably occur, and as the time grew nearer and nearer the more desperately did he attempt to make the ascent, but all to no purpose.

The first shot went off, scattering rock in every direction around him, and hittiug him in various places ou the body, limbs and head. The second, third and fourth followed in rapid succession, but with less serious results to him. The injuries he sustained were mostly received from the first shot. He is lacerated aud bruised from head to foot, although none of the wounds were deep.

The Roanoke Mining Company.

Condensed from the Calaveras *Chronicle*.

The mining property of this company is near the head of Chili gulch, one mile southeast of Mokelumne Hill, and consists of 3200 linear feet northerly and southerly along a quartz lode, of which 1800 feet south is the Lamphear mine and 1500 feet north is the Moser mine. Tbe two properties have recently been capitalized for $200,000.

The underground work consists of a crosscut tunnel driven in from tbe side of the mountain 400 feet, at which point the vein was cut at a deptb of 85 feet from the apex of the lode aud near tbe center of the consolidated property. A lateral drift has been driven north along the vein 412 feet, all the way in quartz, which was put through tbe mill and more than paid the expenses of running the level. Several upraises were made from this level, all of which paid well. South of the crosscut tunnel a level 250 feet has heeu driven and is being pusbed ahead. At the point where tbe tunnel bas intercepted the vein, a prospecting shaft is now being sunk in the fissure of the vein at the rate of tbree feet a day. It is now down from the apex of the vein 130 feet aud from the tunnel level 45 feet. This sbaft is well timbered with square timber 10x10. The vein at the bottom of the shaft measures fully five feet of solid quartz of a ribbon nature, carryiug about one per cent of iron and galena sulphurets. The vein is magnetic north and south, and at the bottom of the shaft very nearly perpendicular, witb a slight dip to the west. It shows great regularity; the walls are well defined, and with the present development it shows 700 feet of an unbrokeu ore chute, which extent is remarkable for the present depth.

The work now heing performed in the mine is dead work. Tbe mill is kept runniug half the time with 13 men in the mine. A receut ruu of 32 days was made, the result of the clean-up being nearly $5000. The gold is very coarse, nuggets being found in the battery ranging all the way in value from $10 to $300.

This property helongs to the mother zone veius, although its polar treud differs slightly from the generality of the mother veins, caused by the protrusiou of the granite horse.

The mine is located within a few hundred feet of the head of a long and remarkable cauyon, known as Chili gulch—remarkable for its output of placer gold. Tbe canyon itself was very rich, and after it was washed out the sides or hanks were found to be overlaid with volcanic ash and beneath it auriferous gravel channels, from whicb millions of gold was taken out and which are still yielding quantities of the precious metal. Chili gulch, from its source to its outlet, passes through the mother zoue and empties into the Calaveras river a short distance above North Branch, on the road leading from San Audreas to Valley Spring, the canyon being over six miles in length.

It is a fact the world over that two-thirds of the rich mines of the world happen to be located at the head of long gulches or canyous. Instances—The Comstock mine at the head of Seven-Mile canyon; the celebrated Mono mine at tbe bead of Dry canyon; the Bingbam mines of Bingham cauyon, and the Emma and Flagstaff mines at the head of Cottouwood canyon in Utah; the old Gwiu mine in Rich Gulch cauyon, and also many of the celebrated mines of Mexico are located at the head of long canyons.

The Roanoke lode is inclosed iu slates. The footwall or west wall is metaphoric, syenitic and porphyritic slate. The hanging or east wall is the usual laminated slates of the zone, with many stringers of quartz cutting diagonally across the wall slates and hottoming in the lode vein at various depths, thereby enriching the veiu at the point of contact.

The Gunsight Country--Pima County, Arizona.

To the Editor:—An erroneous impression prevails that the Gunsight country is an inaccessible and waterless region, remote from supplies and generally a desolate desert bordering on Sonora, the "Land of Manana."

The shorter route is by way of Gila Bend, on the S. P. R. R., 85 miles; by Tucson, 120 miles. A natural roadway, generally hard gravel mesas, packing under travel until the detrital deposit of porphyry and granite, blending and cemented with volcanic ash and lime, rivals the best work of man. With good American mules a ton to the animal can be hauled.

The gold fields are situated in a metamorphic grey granite basin, in extent 13 miles by 4, the greater distance northerly and southerly, and hemmed in by detached porphyry mountains: an exceedingly interesting country to the mining geologist and an ideal topographical region for a mining camp; extensive grassed valleys with isolated patches of hills, hardly attaining the dignity of mountains; the Sonora, Mexico, boundary line 18 miles distant and 75 miles to the Gulf of California; an equitable climate, the heat of summer tempered by sea breezes, and at an elevation above sea level about 3000 feet. The geology of the country shows this low-lying hillock and higher granite hills to be much broken up and distorted; quartzite ledges from a few inches to two feet wide traverse the country, generally paralleling the quartz veins. They cannot be classed as dikes, as they are too irregular in their strike, at times intersecting the smaller quartz veins. In the lower country much common magnesian limestone of a sedementary nature occurs. I think simply as a surface deposit. Veins of quartz, some with a blending of fluor spar, having generally a northerly and southerly trend, many with an easterly and westerly strike exist, also interlacing feeders, and stringers of rich quartz. In places large blowouts of white and cream colored quartz show on the line of veins and a prodigal abundance of float, all of this quartz hornspooning well in gold. The Indians washed for gold in the bateo for years. No work of moment was attempted until the past year, just a surface gouging where little labor would accomplish much. On those veins carrying fluor spar the character of the ore will change, lead or copper coming in with depth with a good silver value—the gold not necessarily decreasing, but the character of the rock changing from a free milling, which it now is, to one requiring a different treatment.

The quartz is friable, in color a bluish white, and cream tinted, this latter the richer, much of it being honeycomb quartz, this oxidized iron variety very rich; black and brown hematite imprisons a high value in gold, requiring longer treatment in stamp mill battery and concentrators, this class likewise is rich.

Iron pyrites are rarely found, and occasionally patches of galena occur in those veins with the fluor spar blendings, and copper sparingly as an oxide and carbonate.

Water is abundant, and can be secured in any of the larger valleys at a depth from 500 to 800 feet; at other more favored points, as at the Ajos, in 30 to 40 feet dug wells.

On the Ide mine, shaft No. 1, dip to east 30 deg., quartz on surface filling the 6 by 4 shaft, this pay has pinched to 4 inches at a depth of 15 feet, where a slight faulting of vein occurs, the pay rock in 20 feet widens to half fill the shaft at 20 feet, and continues thus to pinch and swell to bottom of shaft.

A one-half to 3 inch rich pay streak goes down on the footwall that crosses, quartering, to hanging wall at 20 feet deep. The quartz, a fine milling grade from surface to floor of shaft, continues on one or both walls; enclosing walls granite.

A parallel lode on same claim is found in vein No. 2, a shaft 12 feet deep, width of vein smoothly in place 5 feet 3 inches, principally fluor spar, showing good colors in pannings; strike northerly and southerly. This opening, from shaft No. 1, 100 feet west. This is a strong vein cropping and traceable for miles. To south one-half mile is the Ontario. Shallow pits in limestone show a 2 feet vein, prospecting well in gold, gangue, quartz and fluor spar, carrying nuggets and kidneys of galena and yellow crystals of lead-molyhdates. The Cucumongo, same as Ontario in work and rock. A number of other claims, small surface cuts, exposing good milling rock, were visited, but space forbids mention. A shot-gun tramp over the undeveloped King Solomon, Oro Grande and Sierra Madre claims—Andrew Kozik, discoverer and part owner,—noting the huge outcrops and securing samples of rich honeycomb quartz that will run three figures in value.

The Montezuma Gold Mining Co., or what is locally known as the New York Company, are New York capitalists operating in Arizona, consists of six full claims in a block, the Dorsey having the greater development, with a shaft 54 feet deep; at 24 feet a slight fault occurred in vein, recovered in 2 or 3 feet, and continues without a break in the quartz vein from surface; but 4 inches wide to 12 inches in width, and increasing with depth. Three years ago Dorsey, the original locator, arrastraed $8000 from the open cut drifts and shallow workings now showing on pay, and recovered about one-third the true value of the rock. Unfortunately for both, probably, he killed an Indian and skipped over the border, the property lying idle until housed by Mr. Wheatley and associates. The lode shows for itself, tells its own story of rich rock in a strong vein, and approximates a mine nearer in point of development and value of rock in sight of any seen in this gold belt. The Aurora, an extension northeast, is opened by many cuts and shafts, showing same class of quartz and continuity of lode on its regular course.

Headquarters Camp is about one mile from the Dorsey westerly, and a mile north from the People's Co. camp, and carry the largest working force now in the district. Here we find the Enterprise group, under hond to Supt. Wheatley, with the California a half-mile distant to the east, cropping on mountain-side north and south; strike in line, porphyry and granite contact. The quartz shows some copper as a carbonate and specks of cuprite (red copper ore). Vein pinches and swells, as is expected in this broken formation, and, with exception of shallow pit to north, comprises development here. The Valley group has on the Raymond a 30 foot and 20 foot shaft, connected by open cuts for some distance. Ore arrastraed therefrom by Wall & Dickerson two years since; vein, 14 inches wide, arrastraed $30 a ton. tailings giving $50 per ton by assay. Seven claims in this group are under bond.

Wall & Dickerson have on the Grant a 25-foot shaft and other openings, from which they work by arrastra $40 rock; trend northeast and southwest, dip to east. Raymond (16-inch pay seam) and others, original locations.

In the valley, toward the porphyry belt of the Gunsight, in limestone and granite, two miles from People Co. camp, we find the America and Gold Rock. Shaft No. 1, 30 feet deep; shaft No. 2, 200 feet north, on 6 to 14 inch pay quartz. These claims have some rich croppings, and below surface gold patches of galena in gangue stuff, and some fluor spar leads to the belief that the quartz will be less free in depth, though not losing value of gold held necessarily. This should develop into a good property.

On the home swing a brief call was made at the Gunsight free-milling silver mine and mill, now in care of a keeper until the white metal shall have somewhat recovered its real worth. A complete 20-stamp mill plant, tank system, steam hoist, worked to 300 level and opened 200 feet deeper; a black spar, heavy spar (barite) and quartz is the gangue matter, silver chloride the mineral, with some kidney, high-grade galena. An 800-foot driven well, having 600 feet of water in it, five miles away, is pumped to mill and sold to stock men and miners.

There is gold in great quantity in this district on the surface, and if judiciously and economically worked, with a practical knowledge of mining geology as applied to this peculiar field, there should be paying mines found.

Borax Works in Operation.

The borax industries of California and Nevada represent an annual value of one million dollars. Like other coast products, this value is largely affected by pending tariff legislation. Following is a list of all the borax reduction works now in operation in the two States: Smith's borax works, twelve miles north of Daggett, Cal.; Searls, sixty miles east of Mojave, Cal.; Conn & Trudo, Saliua valley, fifty miles east of Big Pine, Inyo county, Cal.; Calm's, Columbus marsh, Esmeralda county, Nevada; Rhodes' marsh, on line of C. & C. R. R., near Bellevile, Nev.; State Line marsh, Nye county, Nev., 120 miles southeast of Candelaria; Schmidt's works, White Plains, Nev.; Neuschwander plant, sixty miles south of Lovelocks, Nev.

In the Mammoth-Champlain case at Provo, Utah, the effect of the decision is that the defendants are wholly enjoined from working the disputed ground lying east of the Mammoth 37 side line, and the plaintiffs are enjoined from working in that portion of the disputed ground lying east of the Mammoth 37 side line and south of a line parallel with the Mammoth 37 south end line, and passing through a point south of what is known as the apex cut. This excludes the plaintiff from a strip from about 80 to 100 feet wide and the full length of the disputed premises, and allows them to work the remainder.

Near Baker City, Or., the Virtue mine recently yielded a $9,000 clean-up; the Moores mine is kept running night and day. Ten stamps will soon be added to the mill, and a concentrating plant has already been added. A run is being made at the Sauger mine. Only about 100 tons of rock will be crushed for the present, but there is some prospect of the mine being operated on an extensive scale before long. The Nelson placer claim is running full blast with an abundance of water. The Robbins mine on Pine creek has started up again.

During the last week in June the mines about Hillshoro, N. M., produced 400 tons of gold ore, more than half of which came from the Standard.

More Amusing than Likely.

Some interesting fiction comes over the wires in press dispatches, often followed by denial; oftener lost amid the mass of matter. Under the guise of an alleged letter received by a Canadian, the following summer story is to hand:

Following is the alleged letter, which though written last February, has "just come to light:"

Guatemala City, British Honduras, Feb. 22, 1894.

Monsieur M. O. Nay, Toronto, Can., Dear Sir: In accordance with the by-laws of our organization, I have established all the necessary machinery on an island formerly known as Ruatan, belonging to British Honduras, which has no extradition treaty with the Government of the United States. Therefore, if we are discovered in our really philanthropic efforts to furnish the people of the United States with a proper per capita circulation of silver dollars, each one made of as much pure silver as the United States Government Mint uses, we could not legally be taken from this island for punishment to the United States. We have already purchased 100,000 pounds of silver bullion, 12 ounces to the pound, at less than 70 cents per ounce. We have the best possible dies in the world, and we have an honest, full weight, United States dollar of 412½ grains every time. It will not be a counterfeit, but a perfect facsimile and duplicate of the 412½ grain silver dollar which Uncle Sam is so penurious about coining and circulating among his nephews and nieces. Landing 100,000 pounds of silver, Troy weight, on the island, we shall have 1,200,000 ounces, which in grains make 576,000,000; and this divided by 412½, the amount of grains to go into each dollar of our free minting, $1,396,363. Thus we convert the silver bullion which cost us, at 70 cents an ounce, $840,000, into $1,396,363.

The net profit is $576,363, and the entire transaction has scarcely taken ninety days. The next step is to convert this silver into stocks, bonds and mortgages and sell them later on for gold, which will be taken to Europe. This ought to be accomplished during the summer and autumn of 1894.

The necessity for the most profound secrecy is obvious. The advocates of free silver, especially Senator Stewart and those who follow him, are also intent in their endeavors to rescue American commerce, manufacture and labor from the oppressive clutch of the gold bug standard and to restore the white metal—the poor man's money—that we are certain to have their continued support.

The Count of Monte Cristo was not "in it" for wealth as compared with the possibilities of this island at Honduras for the evolution of innumerable silver dollars of 412½ grains, each with a profit of 40 cents on every last one of them. It will benefit the laboring men of the United States, and also the farmers, who are solidly against a gold unit of value. This free coinage mint hidden in the far off island, will be a perpetual blessing and beneficence for all the millions of bread winners in the American union. It will accomplish what a monopolistic, capital ridden Congress failed to bring about. It will give them plenty of cheap money.

The literature in favor of free coinage should be kept fully up to its present high pressure. We need the words and work of Bland, Bryan, Jones, Stewart and Teller served burning hot every day from the rostrum and the public press. It would ruin the enterprise if the public ardor in favor of the white metal—the money of Hamilton and Jefferson—should be allowed to cool off at all. While the fervor is on we should melt our bullion, make and market our dollars, and prepare to retire in ease and luxury to some foreign country with the gold we have derived from their sale. Extradition cannot reach nor gold bugs and Wall Street paralyze our profits of 40 cents on each honest dollar thus coined.

By the first day of June we should have converted silver bullion amounting to at least $125,000 which would be smuggled into the United States by way of the Gulf of Mexico and the Gulf of California, via Guyana, Nogales, Kansas City and Omaha, converted into gold, and have deposited it to our credit in London. At Omaha there came near being an exposure. D. E. Seavior.

N. B.—Send your reply care of Pierce M. B. Young, Envoy Extraordinary and Minister Plenipoteutiary, Guatemala City.

The Resurrection Mining Company is about to resume operations on the New York group of claims in Big Evans gulch, on the Leadville, Col., gold belt. There are, says the *Herald*, twelve claims in the group, and from these the old New York Company took out $750,000 from the first contact. The new company will start in by lifting ore from the first contact and later on sink a shaft to the second, where the gold chute is known to exist. The mineralized property of the company covers eighty acres. Development will be pushed on a large scale, and with the aid of the best appliances.

In the Jicarilla mountains, New Mexico, gold in pay quantity is being found. A prospector says, "the mineral is a sort of talc, mixed with a decomposed rock heavily streaked with magnetic iron. The best pay comes from a blow out."

Southeastern Nevada.

In Lincoln, Nev., the *Record* says the mining industry of the southern portion of the county is coming to the front.

A deep cut has been run on what is known as the Big Ledge, situated one mile south of the Capital shaft. The cut is in thirty feet and taps the ledge at a depth of thirty feet: the ledge being about two and a half feet wide and averaging $50 in gold.

A load of ore from the Monitor mine has been shipped to the El Dorado mill as a working test and the result is eagerly looked for. The ore is carbonate; formation tracite and the veins run east and west and pitch to the north. The mines are but three miles from the Colorado river and a fine road can be made down a wash with but little expense. In the workings of former years no assays were taken for gold, and the silver value being too small to open up the claims, going only about four or five ounces, they were neglected.

About twenty-two miles from the Vegas ranch and on the road to El Dorado Canyon, a strike has been made by W. J. Stewart of the Vegas ranch. Samples taken from the croppings go from $10 to $100 a ton in gold.

The late trouble at the Keystone mine in Yellow Pine mining district over the thefts of ore ended in nearly all the men being discharged, and replaced by new ones. The company at present is working thirty men. They are down 400 feet. The Keystone mining company has two other claims at Shadow mountain, thirty miles from Keystone, in California, across the line. Two men took out twenty tons of ore in a week's time, and the teams have commenced to haul ore from here.

The mill is situated eight miles from the Keystone mine at what is now called Sandy City. Fifteen tons are put through every day and the average workings for the last three months have been ninety-six per cent of the assay value.

Some eastern capitalists are at present negotiating for the purchase of the Clementina mine from J. V. Keeley. The property is one of the best in Yellow Pine mining district and needs but capital to bring it to the front as a large producer.

The population of Keystone and Sandy is about fifty.

Crescent City is a new place that has sprung into prominence within the last year. It is situated in the southeastern portion of the county about 240 miles from Pioche, and fourteen miles northeast from Vanderbilt, California.

The Legal Tender Mining Company has completed a five-stamp gold quartz mill from the Fulton Iron Works of San Francisco, with a corrugated Frue concentrator, the capacity of the mill being fifteen tons a day. The engines and boilers were put in heavy enough, should the developments justify it to increase the number of stamps. At present only enough water is to be had to run five stamps, but work is going on to develop more if possible.

The company own some fifteen mining claims, but so far have confined their work to one mine called the Legal Tender, upon which two shafts have been sunk 200 feet and about 100 feet apart, connected at the 100-foot level with a drift run for ventilation. The vein averages four feet and the pay streak about twenty inches. Numerous drifts have been run, all showing up well and averaging about the same for the pay streak in them all. No stoping has been done, and the amount of ore taken out is about 400 tons of an average of $58.20 in gold per ton. Some work has been done on all the other claims and they all show pay ore. The company have been working twenty-five men nearly all winter and have about that many employed now.

A fair estimate of the amount of ore in sight in the Legal Tender mine is $200,000. The company have expended some $30,000 already and have just negotiated for the purchase of another mine at $12,000.

There are about 65 men in the district and a mail service is soon to be established between Crescent and Vanderbilt.

The Dam at Deguerre Point.

The Marysville *Democrat* says: The *Appeal* contains an article, evidently written by Geo. Ohleyer, in which the reader is informed that the matter is very significant as telegraphed from Washington, and that the people of the valley will never have peace, nor will the impending ruin to the rivers be obviated as long as it is proposed to mine by the hydraulic process and dump into the rivers with or without restraining dams. There is nothing unusual in the proceedings in the Senate Committee on Commerce in the proposition to appropriate $100,000 to improve the rivers, as it is strictly in conformity with the recommendation of Board of Engineers and the present United States Debris Commissioners. As we have heretofore stated, they have requested Congress to appropriate a sum of money to be expended in constructing a wall or dam at Deguerre Point which will restrain the debris now in the streams above that point.

Congressman Caminetti, Senators White and Perkins, and Congressman Maguire, favor said recommendation, and are working to get at least $100,000 with which to have the work commenced at as early a day as possible.

The work of the obstruction committee who visited Washington last winter, of which George Ohleyer was a member, retarded the work of securing an appropriation for a time, as they were opposed to it: but after they left the Capital progress was made under the efficient work done by the members of the delegation favoring it, the result of which is the recommendation of the Committee on Commerce that $100,000 be appropriated. The opposition, voiced by the *Independent* and *Appeal*, represents the sentiment of a half dozen cranks, who either have lost or fear they will lose an occupation, but does not in any sense reflect public opinion. These articles are an insult to intelligence, as in the accusations the Congressmen, Senators and United States Commissioners who favor the appropriation are accused of conspiring to obtain money from the Federal Government to be used wholly in the interest of hydraulic miners. We take occasion now to say that we have interviewed several prominent citizens as to the position taken by these journals relative to the contemplated work at Degnerre Point and that not one person approves the sentiments expressed, but they do favor the appropriation.

San Bernardino Prospects.

To the Editor:—A recent trip to the country lying between the Southern Pacific Railway and the Atlantic & Pacific in San Bernardino county convinces me it is destined, in the near future, to become a large gold-producing district and a desirable section for investment of capital; also that it is, at the same time, adapted to the interest of prospectors with small means, energy and pluck.

Gold predominates, but some ledges carry a percentage of silver. They are apparently well-defined veins as a rule, increasing in quantity and holding their quality, as development has thus far proved.

This country, like all isolated portions of the desert province, has been, and is now, comparatively unknown to any considerable extent, but is, I think, well worthy of investigation by those who feel interested in the mineral-producing sections of our State.

Some properties are being equipped with mill machinery with every prospect of fair returns. In the vicinity of Twenty-nine Palms, say within a radius of 25 miles, in any direction, there are well-formed veins of auriferous quartz, and other things being favorable, it seems to have a good prospective future. According to my judgment, from a geological standpoint, and although comparatively little has been done toward development, the indications for permanence are flattering.

To reach this district, take the Southern Pacific route to Banning; or if driving through, go to Whitewater, thence through the Morongo pass to Warren's ranch and onward to Twenty-nine Palms, where there is an abundance of water and fuel for camp purposes only.

As an illustration of what is now being done with prospect claims, I will cite one belonging to J. W. Parks, which he is pleased to call his "Summer Queen," six miles south of Twenty-nine Palms. He has followed his ledge for a depth of 45 feet, and from a small pay streak, richer than the balance, has cleaned up something over $1600, or about $40 per foot in depth, and has on the dump over 100 tons of ore worth something like $25 per ton. The tailings from his arrastra carry a considerable quantity of sulphurets worth running through a mill. The ledge at the cropping is about two feet thick and has increased to five feet at the bottom, with a well-defined formation.

Fuel is scarce, but the Utah Southern, also the Southern Pacific, have staked out lines in the vicinity which will ultimately provide for the necessary accommodation as soon as the traffic is in sight to warrant their building. T. A. Darling.

It is understood that under the direction of Mr. Walcott, the new head of the United States Geological Survey, that branch of the public service will strive to be what its name implies: that geology will be attended to and other things let alone. The idea is a good one, and if Mr. Walcott will act on it, his administration will be in brilliant contrast to the scattering tactics that of late years have tended to interfere with the usefulness of that important Government work.

The number of men now employed at the Cripple Creek mines, not counting men who are working for themselves, count up 1236, which probably exceeds the number at work in any other district in the State. The heaviest force, ninety men, is employed at the Pike's Peak. The Cripple Creek *Journal* says that from 1500 to 1800 men are engaged in prospecting, leasing, ore hauling and milling.

The New Kennedy Mines.

A miner writing to a local journal from the new mining camp of Kennedy, Nev., says:

Kennedy gold field, now the center of so much attraction, lies on the southeastern slope of the range running northeast from Cinnabar mountain, which again is about 20 miles southeast of the old mining town of Unionville. The town itself is pleasantly situated in a shallow canyon, and is well supplied with wood and good water. There are probably about 20 frame buildings and quite a number of tents scattered around, while a few primitive dugouts may be seen in such close proximity to the creek as to make one shudder for the occupants in case a cloudburst took place above. But this embryo town has, it seems, already got a skeleton to give it a set back. The ground on which the lots were taken up and in some cases houses built was subsequently located as a townsite, and now it is feared there will be litigation and what may be worse but not unusual where claims conflict and the arm of the law is weak.

The miners are very hopeful over the prospects, and '49ers, now (by a reversal of the figures) '94ers, were there celebrating what they reckon to be a return of the good old times. But without intending any prejudice whatever to the camp, the rush thither is more indicative of the really hard times that generally prevail than any unusual inducements in the shape of rich gold mines. That some of these exist has been amply demonstrated, but the ledges in general consist of low-grade, ferruginous ore, refractory in its character, and yielding from $10 to $35 of the yellow metal to the ton. The ledges are in a granite formation, which is considered a good indication that they will go deep down, and vary from several inches to several feet in width. Ore taken from a ledge which was tapped at about 100 feet from the mouth of the tunnel, upon being pulverized and horned out, failed to show any gold, but the owner stated that if tested at the forge the much prized metal would show up. The present mill failed to work the ore successfully, and this has been quite a drawback to the camp, as there being, with some notable exceptions, no shipping ore the miners have been unable to realize, and consequently money is scarce and progress slow. When, however, the new mill is put up and the ore is treated by such a process as will extract and save all the gold, then we will be able to form a better idea of the Kennedy gold field and its possibilities. Prospecting has been carried on very extensively, both on the east and west sides of the range, and the ground for a radius of many miles has been located. Prospectors here enjoy exceptional facilities, there being plenty of water and wood and excellent range for their horses.

Kennedy is about 45 miles from Lovelock by the nearest route, and the journey will occupy about nine hours with a good team when the road has been improved. Travelers are warned not to take the road by Say's canyon, as it is very rough and on the east side of the range very precipitous, passing at one place through a matted jungle of cherry bush, where horses and driver on emerging from the thicket may thank their stars if they have escaped without the loss of their eyes. The road by the canyon north from the Say ravine is said to be a passable enough one. A stage runs from Lovelock.

To those in search of employment there is no chance at present in Kennedy. The remark of a resident of the camp is significant enough on that score, and is here repeated: "That for each job there are more than five applicants."

The final argument in the famous case of the heirs of William Wood against J. B. Wheeler and the Aspen Mining Company is being made in the United States Court in Denver. The defense set up a question claiming the right of ore bodies on the Emma lode and mining claims by virtue of an apex within the surface lines of the Spar claim, which was also owned by the Aspen Mining and Smelting Company. The court held that no such claim could be set up by the defendants in the suit, and ruled out all expert testimony, maps and evidence which was offered before the Master in Chancery in support of the apex claim. Wood, with two others, was the original locator of the Emma mine. He disappeared before the real value of the property was known, and died in Canada. The other two owners sold their interest to J. B. Wheeler, who developed it into one of the richest mines in the West, when the Wood heirs brought suit for a third interest in the mine, as well as their share of what had already been taken out of it. The case has been in court for ten years, and the amount they claim is about $4,000,000.

The Denver *Record* says the largest mining deal of the season in San Miguel county has been consummated by Jas. Johnstone and O. N. Davis leasing and bonding the Roy Johnstone group of gold mining claims to Messrs. Beam, Chapin and Whiteman of Telluride for $150,000. The group is composed of 12 lode mining claims, bearing gold, and is situated in Prospect Creek basin, about six miles south of Telluride.

Gold is cited as the only thing that cannot be lessened in price by the action or inaction of Congress.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER IX.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

A ton of Virginia cannell coal yields products as follows:

Kerosene	25 gallons
Lubricating oil	10 "
Naphtha	10 "
Paraffine	10 pounds
Ammonia	10 "
Carbolic acid	10 "

And usually from 1000 to 1200 pounds of coke.

1855.—Two men, Eveleth of Maiue and Bissell of Louisiana, brought samples of crude mineral oil from Oil Creek, Pennsylvania, to Prof. Benjamiu Silliman Jr., at New Haven. Early in 1855 he made his report aud showed that the oil possessed high illuminating and lubricating properties, upon which the Pennsylvania Rock Oil Company was incorporated, which purchased oil lands at Titusville. Col. E. L. Drake was sent by Jas. M. Townseud to examine them. His report beiug favorable, a new company, "The Seneca Oil Compauy," took the place of the original, and Drake accepted the office of superintendent. The oil was at first gathered by digging trenches into which it flowed, blankets were spread as in early times, deseribed iu this history. When they became saturated they were wrung out and relaid. The supply being limited, Drake determined to bore into the earth for a larger yield. This idea was not uew, but possibly grew from the knowledge of the flowiug well in 1829 and the experience at the salt wells at Tarentum.

In 1856 Samuel Dowuer, a whale oil merchaut, erected works in Bostou and employed Mr. Joshua Merrill, a practical chemist, to experiment with hydrocarbon oils. Some 400 tons of Triuidad asphalt were consumed in these experiments. The first illuminating oil from mineral sources was produced at this time.

1857.—The manufacture of oil from albertite coal from Hillsboro, New Brunswick, was iuaugurated iu Boston, in Downer's works. Fifty stills produced 900,000 gallons of crude oil annually for four years.

1858.—Several hundred barrels of Peunsylvania petroleum were sent to Dowuer's works for refiniug. As the production of crude oil increased the use of albertite was diminished, and was wholly discontinued in 1865.

1859.—On the 29th day of August, 1859, the drilliug tools in the Drake well at Titusville, at a depth of 58 feet, struck a cavity from which the well filled up with crude oil nearly to the surface. A pump was rigged aud 500 gallons per day were lifted from the well. This was eonsidered a great suceess. With improved appliauces the supply inereased to 1000 gallons per day, worth oue dollar per gallon in the market. As barrels were scarce and the oil supply increasing, it was found impossible at first to store the oil. The system of storage tanks was soou after invented, whieh made the present petroleum trade possible. The total production of crude oil for the year was estimated at 2000 barrels.

The Drake well met with a misfortune. Something going wrong with the pump, the engineer entered the pit in the earth above the roek in which the well was sunk, with a lighted eandle. An explosion of gas followed, which burned the building and temporarily put an end to all operatious. Wheu spriug opened and the Seneca Oil Company resumed operatious, so many wells had been sunk that, instead of one dollar per gallon, the price of oil had fallen to oue dollar per barrel, with a limited market.

The crude oil was not suited for illumiuating purposes; the art of refining it was in its incipiency, suitable lamps had yet to be invented, and the whole busiuess was in a primitive eonditiou. Drinking water was contaminated with oil to such extent that a barrel of drinkable water brought from a distauce was at one time worth more than a barrel of oil. But these difficulties were at last overcome, until at the present time there are but few great natural produets managed with more skill, judgment and ecouomy.

From this date until 1886 the increasing production of oil aud the wild speeulative excitement which followed were considered one of the wonders of the age.

There were extensive coal oil distillation plauts still in operation in Virginia, Kentucky and Ohio. The kerosene works on Long Islaud, New York, were operated on a very large scale, the daily produet from which was estimated at 5000 gallons, or 1,500,000 gallons per annum.

1860.—The first flowing well was developed, after which for a time the supply exceeded the demand, and oil was sold as low as five ceuts per barrel. The Hamilton-McClintock well, two miles north of Oil City, Peunsylvania, began to spout petroleum at the rate of 60 gallons per minute or equal to 2160 barrels in 24 hours. People were astonished at the strange sight—a geyser of oil which could not be controlled or the produet saved, for most of the oil went to waste. A pond 25 square rods in area is said to have filled. In September of the same year, a most intense excitement arose at Oil Creek. The Dom Pedro well burst into an eruption of petroleum. During the first 24 hours it flowed 4000 barrels, and continued at nearly the same rate for a long time. The excitement increased to an extent before unknown. A newspaper published in the oil regiou about that time contained the following:

"So much oil is now produced that it is impossible to care for it, and thousands of barrels are running into Oil creek. The surface of the Alleghany river is covered with oil for miles below Franklin. Some wells are being plugged to save productiou. Fears are entertained that the supply will soon be exhausted if something is uot done to preveut the waste. Our water ways and farms are saturated so deep with the surplus of this dangerous fluid that vast fires are also to be feared."

1861.—A well in Veuago county, Pennsylvania, begau to flow mineral oil; 100 barrels were filled during the first 16 hours, when, there being no more storage room, it was reluctantly allowed to run to waste. The Phillips well at Oil creek commenced to flow, yielding the first day 4000 barrels. After this, spouting wells ceased to be a novelty. During this year oil begau to be shipped down the Alleghany river in barges and flat boats.

1864.—The great oil works of James Young at Addiewell near Edinburgh, Scotland, commenced operations. The compauy raised an immense quantity of bituminous shale, or shaly coal, from pits near the works. The production of petroleum in the United States had not at that time been felt in Europe.

1865.—Up to this date more than 1000 teamsters did a thriving business in hauling oil in barrels and the empty return packages, sometimes receiving as high as $3 per barrel. When during that year the first pipe line was laid, they were almost suddenly thrown out of employment, aud it is little to be wondered that they rose in riot against the innovation and that armed guards were necessary to protect the pipes from their fury. Many oil wells were sunk in Pennsylvania, three-quarters of which were unproductive, yet the yield of petroleum was very great. Col. Roberts of New York invented his torpedo, by which dry wells were sometimes made productive and exhausted ones restored.

1871.—The oil works of James Young near Edinburgh were doing an extensive business. They covered an area of 50 acres and gave employment to 1500 men. The products were valued at $5000 per day. The plant ineluded 354 distillation retorts with a capacity of 3000 tous of shale per week, equal to 120,000 gallons of crude oil, which yielded 50,000 to 60,000 gallons of illuminating oil, about 12 tons of refiued paraffine oil and a large quantity of heavy lubricatiug oil each week. Several tons of sulphate of ammonia were reeovered from the ammoniacal waters. Each ton of shale mined at Addiewell produced from 30 to 40 gallons of crude oil and 3500 cubic feet of gas with the eonsumption of only 280 pounds of coal nsed as fuel. About 500 tons of paraffine candles were anuually produced. At the same time sulphuric acid was made at these works from pyrites, 36 tons of pyrites being eonsumed per week (American Exchange and Review, Vol. XX, fol. 286).

From 1865 to 1874 many spoutiug wells were opened and speculative excitement ran high. After this the oil industry was reduced to an ordinary business, and the excitement quieted down or burned in different ehannels.

1879.—The first tide-water pipe line was laid from Bardford to Williamsport on the Susquehanna river in Lycoming county, more than a hundred miles distant.

When the prescut bounteous deposits of petroleum wholly fail or greatly diminish, as in time they certainly will, we still have the shale and lignites to return to and the experienee gained will be of great service. While the yield will be smaller, and the cost of production greater, we shall probably never—at least uot for a loug time—return to or wholly depeud ou the whale fishery for a supply of illuminating oil.

The lesson learned during the profusion of gas and petroleum will serve well when the excess is exhausted. Instead of outfitting ships to brave the perils of Arctic seas, man will retort coal, asphaltum and bituminous shales and turn eoal waste, lignites and crude petroleum into gas and coke, the former to be employed both for heating and illuminatiou, and driving gas engines, aud the latter as a elean and economical fuel. The time when all will be exhausted is too far distant to be of interest to the present population of the earth.

(To be Continued.)

Opal Mines Deserted.

The Nampa, Idaho, *Leader* says: Reports from the Owyhee opal fields are anything but eneouraging. Not a man left iu camp and the visitor may enter mines and earry away what he finds. What a pity it is indeed that these stones canuot be marketed, for it is an undisputed fact that they surpass anything in the opal line in the world. The famous Shirley mine, from which the opals that took first prize at the World's Fair were takeu, has also been deserted, and, although the mountain contains gems enough to supply the world—and of the rarest beauty, too—has not as much as a "keep out" notice posted up to warn off the inquisitive prospector. Only a short year ago there were probably a hundred men in camp, and many of them possessed a can full of these beautiful stones, that would have dazzled the eyes of a native from the great opal fields of Central America, and which had a commereial value of from $3 to $35 per karat, yet no buyers could be found; and now these men are working rockers on Snake River, barely making a liviug. It is to be hoped that there will yet be a demand for Owyhee opals and the fondest hopes of those who own the claims may be fully realized.

A Placer-Working Machine.

J. A. Elliott of Butte, Montaua, is the inventor of a machine for working placer gronnd, which is described iu the *Inter-Mountain*. A machine ten feet high and three feet wide has been built for experimental purposes, and the results obtained from the practical working of ground in the vicinity of Butte have been very gratifyiug. On the frame work of the machine are suspended three paus six feet long aud 20 inches wide, with riffles at the bottom, and connected together by two straps. These pans are given a rotary motiou by eccentrics connected to the main shaft. A crank placed on the main shaft gives the pans an oscillating or rocking motion, or as a placer miner would say, a "hen-wallowiug motiou."

These pans are placed oue above the other, in such a way that the fine gravel falls from the first to the second and from the second to the bottom or amalgamating pan. The water is carried to the top pan by the aid of a simple double-acting pump, which is run by a walking beam connected to the main shaft. The water passes through each pau and falls to the bottom, where it can be collected and used over again if necessary.

The gold-bearing gravel to be worked is first shoveled into a "boot" or box through which a belt fitted with elevator cups runs. This elevator carries the gravel to the top and deposits it in the upper pan. Here the coarse and fine gravel is separated, the fine stuff being carried by the water through a screen to the secoud pan, while the coarse gravel is dumped overboard. Auother separatiou is effeeted in the second pan, and the fine sand and gold passes through another sereeu with a finer mesh into the amalgamating pan. This pan discharges its contents into a tank, where the water scttles and eau be used over again Wheu the gold-bearing earth gets to the third tank it is pretty well concentrated, aud ean easily be collected with quieksilver.

The inventor claims that with a horse power he can run through 50 tons of gravel per day, and that finer gold can be saved this way than by any other method. It is claimed that a miners' ineh of water is all that is necessary to work ground with this machine. In shallow diggings the maehine can be moved close to the work and the tailings can be dumped to one side as work progresses. The whole maehine weighs only about 800 pounds, and it can be carried across the mountains with very little trouble. No cog wheels or gearing are used, the whole action being accomplished by means of chains and sproekets.

Mining Machinery in Honduras.

Writing from Amapala to the British Foreign Office, Consul Rossner gives the results of his inquiries into the trade relations betweeu Honduras, the United States and Great Britain. He states that while Euglish products hold their own in most instances, it is in maehinery and general ironmougery that the American manufacturers are making the greatest inroads. This is particularly the case with regard to mining maehinery, in whieh the Americans turn out a product better adapted to the work required. In reference to this, Mr. Rossner asks: "Is it possible that our manufacturers eaunot make mining machinery that will compete to advantage with like maehinery made in the United States? I cannot bring myself to believe such to be the case; but when I see steamer after steamer, month after month, unloading tons upon tons of Amerieau machinery at this port, I cannot help believing that there is a business defieieney somewhere on the part of our manufacturers that should be looked into aud remedied as quiekly as possible. The same is beginning to be the case regarding edged tools. In former years Hondnranean artisans were eontent with almost any kind of an ax, saw, plane, or chisel, providing the priee was suffieiently low to please them, but they now begin to demand a better elass of tools, and seek quality regardless of price. American edged tools appear to be promiueut as regards quality and temper, but Germany is biddiug for a share of trade in this line with a stubbornness that bids fair to be successful, while our own manufacturers seem to be eontent to manufacture what gave them good results in the distant past, forgetting that others, with less facilities, are striving continually to improve."

Scientific Progress.

Liquid Chlorine.

The critical temperature of chlorine gas, or the temperature below which it must be cooled before it can be liquefied by pressure, is about 33 deg. C., so that this gas may be counted among those which are easily converted into liquids. Faraday first produced liquid chlorine, and described its color as dark greenish-yellow; its specific gravity was afterward determined to be 1.33, and its boiling point 33.6 deg. C.

It is very propable, however, says *Knowledge*, that Faraday little dreamed of liquid chlorine as an article of commerce to be bought and sold by the hundredweight. He would, we imagine, have been rather hard put to it to suggest a material for the condensing pump and reservoir; though in respect to his memory be it said that a very few experiments could not have failed to furnish him with a solution to the problem.

The difficulties attending the production of chlorine, and the impossibility of transmitting it in the gaseous state, have combined to render chloride of lime in this country, and chloride of soda (*eau de javel*) in France, the only forms in which this indispensable bleaching agent can be put upon the market. When it is remembered that chloride of lime at its best does uot contain more than 38 per cent of "available chlorine," the advantage to be obtained in the matter of freight by transporting pure liquid chlorine instead of bleaching powder will be apparent. The actual manufacture of liquid chlorine is now beiug undertaken by a firm of alkali makers at Salindres, the process being conducted as follows, according to M. Fribourg:

The eondensing pump is provided with a piston of sulphuric acid, as being the packing best fitted to withstand the attack of the chlorine. To render such a piston effective, a pump of peculiar construction is of course essential. This takes the form of a U-shaped tube of cast iron, lined with lead. The limb of this tube which is to receive the chlorine is partly filled with strong sulphuric acid, while the other limb contaius petroleum oil, and is provided with an ordinary piston. The upstroke of the pistou raises the petroleum, lowers the sulphuric acid, and allows the chlorine to flow into the vacuum thus formed, through a side tube provided with a leaden (?) valve; the downstroke compresses the ehlorine through another pipe iuto the refrigerated receiver, re-entry into the generator being prevented by the leaden valve.

Such is the somewhat bald information concerning the compressing machinery, with which we have at present to remain satisfied. The receivers iu which the liquid is transported are wrought iron or steel cylinders, the necks of which are furnished with T-pieces carrying two bronze valves, the one connected with a tube reaching to the bottom of the receiver aud destiued to serve for withdrawing the liquid chlorine as such, the other serving for the withdrawal of gaseous chlorine. The cylinder weighs some 225 pounds, aud is capable of containing one hundredweight of liquid chlorine, or nearly 525 cubic feet of the gas. The pressure in the cylinder is 10 atmospheres at 35 deg. C., but they are tested up to 100 atmospheres. The anhydrous chlorine has no action on the iron, brouze and lead fittings.

It is proposed to sell small cylinders containing 10 pounds of liquid chlorine for experimental use, so that the chemist may look forward to a day in the near future when his gas-generating flask shall be shelved once and for all, and his oxygen, hydrogen, nitrogen, carbonic acid, sulphurous acid, ammonia, chlorine and sulphureted hydrogen be at hand, each in its steel or glass cyliuder.

COAL TAR, formerly considered a waste and a regular nuisance to gas-workers, is now utilized as one of the most valuable color-producers. Chemists have extracted from it sixteen shades of blue, the same number of various tints of yellow, twelve of orange, nine of violet, besides numerous other colors, shades and tints. A late magazine writer in summing up an article on "Uses of Coal Tar," says the amount of coloring matter stored in coal is so great that one pound of the common bituminous variety will yield sufficient magenta to cover 500 yards of flannel, aurine for 120 yards, vermillion for 2500 yards, and alizarine for 255 yards of Turkey red cloth.

Few Teeth Pulled Now.

In the course of an address at a dental convention recently a delegate remarked that there is not one tooth lost now where there used to be 100. The day of reckless tooth pulling has passed. It is a mighty poor tooth that the skilled operator of to-day cannot render far better and more serviceable than the best possible false one. If only the root is left a new upper part of porcelain or gold, called a "crown," is fastened upon it so as to be quite serviceable. Supposing that not even the root is left, a gap in the mouth is filled iu with one or more "dummies," securely fastened by a gold "bridge," or otherwise to the sound teeth. Complete sets of false teeth are rare nowadays. On the other haud, people in a palpably toothless condition are almost never seen, the cost of a complete artificial dental equipment being only $16. The demand for "tooth-crowns" comes largely from baseball players, football athletes and bicycle riders, who are very apt to have their teeth broken off short.

But the last and most ingenious resort of the dental surgeon is "implantation," *i. e.*, the setting of new teeth into the jaw. For this purpose real teeth are employed, and not artificial ones. Cocaine having been first applied for producing artificial anæsthesia, a hole is drilled in the jawbone, and into this socket a good tooth newly drawn from somebody's jaw is set. If the patient is young and vigorous the osseous structure soon closes arouud it, and by the time the gum is healed the tooth is ready for use. It should last from three to ten years. In the case of an elderly or feeble person it may be fastened in place by silver wires passing around the jawbone.

The root of a freshly extracted tooth is covered with a delicate membrane called "pericementum," the vitality of which materially assists the wished-for combining of the tissues. Unless the grinder is directly transferred, the vitality of this membrane must be artificially preserved. One way of doing it is to graft the tooth temporarily into the comb of a cock, that part of a fowl beiug well fed with blood, as may be seen from its redness. When wanted for use it is cut out. Ordinarily the patient is obliged to wait for awhile until until the dentist has a suitable tooth freshly extracted, unless he chooses to hire somebody to sacrifice one.

MICROSCOPICAL RESEARCH has proved that the pores of wood iuvite the passage of moisture in the direction of the timber's growth, but repel it in the opposite direction. This accounts for a pheuomeuon which is often noticed, and which puzzles a good many people—namely, why two pieces of timber sawn from the same section of a tree sometimes appear to possess very variable degrees of durability. If the wood, say of a gate post, is placed right end up, the moisture of the soil will affect it, but the rain falling on the top will do little harm; if, on the other hand, the butt end of the tree is put uppermost, the top of the post will decay, because the moisture of the atmosphere will penetrate the pores of the wood more rapidly in this position. Many people have noticed that the staves in a wooden tub appear to absorb moisture irregularly, some getting quite sodden while others are comparatively dry, and apparently almost impervious to moisture. In this case the dry staves are in the position in which the tree grew, while the saturated ones are reversed.

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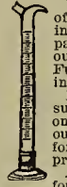

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL NOTES.—*Record:* .There are thirty men at work on the Mayflower properties.

J. R. Tregloan is keeping ten stamps of the South Spring Hill at work on surface rock from the Mediam. The shaft at the Mediam is down about 80 feet.

Repairs at the Hardenburg are still in progress. The mill will soon he in first class order. A reservoir has heeu constructed on the hill ahove the mine to be used as soon as work is resumed. The intention is to sink a winze 200 feet in the north drift 600 feet from tbe shaft at the 800-level, for prospecting purposes. A compressor will be put in to furnish power for the hoist at the winze.

The Gover mine is still in charge of the Sheriff wbo upon order of the Superior Court has two keepers and four men at work keeping the water out. The Sheriff is cleaning up the sulphurets to send them to Voorheis and Barney's reduction works at Drytown. Lane and Haywards of the Utica have made the owners of the Gover an offer for the property which they are considering, and which it is probahle they will accept. Lane and Haywards own the Hazard mine which joins the Gover and have for some time heen considering the advisahility of opening up that property, consequently the ownership of the Gover will give them an opportunity of developing the Hazard through the Gover shaft at far less expense than otherwise would he possihle.

Record: The Pioneer mine is reported to have struck a splendid body of ore.

The owners of the New London mine adjoining the old Plymouth Consolidated are preparing to commence operations in that mine on an extensive scale.

Ground was broken for the foundation of the new twenty-stamp mill at the Pioneer mine, uear Plymouth, last Monday. Work will he pushed ahead as rapidly as possible.

Superintendent Jones of the Bay State Mine says the developments on the 500 level of that mine, as the drift is extended on the ledge, shows improvement in width, being now fully 10 feet, and the quality of the rock is fully up to the standard, some $50 per ton.

A rich body of ore has lately heen struck in tbe main shaft drift on the 800 level of the South Eureka mine. It was at first a narrow seam hut a few inches in width, hut it has now widened out until it is four feet or more in thickness.

At the Wildman mine the thirty stamps are kept husy crushing the rock from the south drifts on the 1200 and 1300 levels. No stoping is yet heing done. On the 1300 level crosscuts have been run showing the ledge to be fully 20 feet in width, and as the drift is extended to the south a steady improvement in the quality of the rock is shown. On the 1200 level tbe rock is as yet of low grade, but the main drift on that level lacks some 150 feet of heing so far south as on tbe 1300.

Inyo.

THE TIPTOP.—*Register:* This is the appropriate name given a mine on the extreme summit of the Sierras about seven miles from Round Valley. It is estimated, from the timher-line indications, to he at least 12,000 feet high. Messrs. S. Thompson and Scbee Bros., of Los Angeles, have honded the property for $10,000, the bond running until December, 1895. Tests of the ore give results as higb as 325 ounces silver and $18 gold per ton. The average of the ledge, whicb is about twelve feet wide, is nearly or quite 80 ounces silver and $12 gold.

Siskiyou.

MINING NOTES.—*Journal:* The ten-stamp mill at the Shroeder mine on Deadwood mountain has started up.

Tbe Austin & Co. blue gravel mine at Greenborn continues to pay, the weekly yield ranging from $900 to $1300. Twenty-one men are emyloyed. The expense amounts to $400 a week. The blue gravel deposit extends across a channel over 200 feet in width.

The Klamath-river miners are discouraged on account of the river keeping up high so late in the season. It has not fallen more than five or six inches since last March, which greatly interferes with efforts to wingdam for tbe purpose of sinking dowu in the river hed to the rich paying chanuels. It is douhtful whether any of the compauies will be ahle to commence boisting before August, which will make the river-mining season very short, as the boisting is generally commenced hy the middle or last of June at latest.

MINING NOTES.—*Journal:* W. H. Crawford and M. Schultz have been at work the past two months putting in a 16-inch flume over 1200 feet in length, and building an independent bridge across Scott river, to carry water from Mill creek to their claim on the west side of the river. They expect to he ready to raise pay gravel this week. They realized good pay for the last month's work last fall, when the high water drove them out, and the uew improvements now completed place the claim in good shape for working all the time.

Klamath river is now falling gradually, as the late warm weather has melted off the snow from the Siskiyou and coast range of mountains to decrease the supply from that source. The stream is almost to its usual summer stage, which will enable the river miners to commence sinking behind their wing, head and foot dams witbout danger of the pits flooding, although they are over a month later than general in hoisting pay gravel, on account of the great quantity of snow last winter.

Mr. Clark, an old Humbug creek miner, had three and a half tons of quartz from the Uncle Sam quartz mine, on Middle Fork of Humbug, crushed last week in the Orr mill, which realized $56 to the ton. This mine was abandoned a year ago as heing worthless. He was unable to sink down farther on the ledge, on account of water, but will he ahle to do so later on as the water dries out, and can also start a pump in keeping the shaft clear of water. The great fault in working some of our quartz mines is in runuing the gold off with the quicksilver—a fact demonstrated hy many persons panning out considerahle gold from tailings helow the qartz mills.

Austin & Co., of the Greenhorn blue gravel mine, still continue to take out ahout $1000 a week, and sometimes more. Prospecting tunnels are to he extended toward the bill in search of a back channel and also down toward the creek. Should no pay channels he found in such efforts, the work will be continued in the present channel and a new shaft sunk down at the old works above, where a large extent of good pay gravel is known to exist. Newt. Lamh, who has opened a claim farther up the creek, will also soon he ready for taking out pay gravel.

Tidings: Over on Horse creek, a tributary of the Klamath river, in Siskiyou county, some very rich gravel heds have heen discovered this summer, and there is considerable excitement over the find among old miners in that region. The stream heads in the Siskiyou mountains southwest of Beaver creek. Its bunch grounds are not extensive, and are already well covered with claims, most of them located by Yreka men. Some miuing and much superficial prospecting has heen done on Horse creek in years past, but the rich diggings now found were not thoroughly tested.

Record: Mr. Rader, who has taken $8000 out of pockets in a rich vein on the stage road between Hornbrook and Yreka, took out another $100 in a day or two with a mortar. Dr. Taylor has an extension on his ledge. Crooker Bros. are ahout completing their wing dam at Anderson's Klamath river ferry. Horn, Smith & Co., one mile farther down, are rapidly completing their wing dam. W. R. Price has bought the Oregon bar and is rafting lumber for a wing dam. The American Bar Company, who run their wbeel over a suspension hridge, are getting ready. C. B. Gillson & Co. are husy piping their blue gsavel.

Trinity.

COFFEE CREEK.—*Journal:* Tbe Underground Treasure Mine, helonging to P. Holland of Trinity Center, is in the bed of tbe creek, which is a deep and narrow canyon. The owner has constructed a reservoir; the dam of which is 75 feet long, 30 feet wide at the hottom, 20 feet wide on the top and 16 feet deep; the gate is a self-shooter 12x14 feet and discharges 30,000 inches of water for about five minutes. This immense mass of water rushes down the narrow creek, which has a grade of 14 inches to 12 feet, with tremendous velocity, turning over immense houlders of many tons weight. He has found one piece of gold $290 in value, one of $212, one of $175, and twothirds of last year's product ranged from $2.50 up to $50. This Coffee Creek country is essentially a coarse gold country.

A HANDSOME CLEANUP.—*Journal:* At the hank of C. W. Smith this week we were shown two gold bricks of the value of over $3000, tbe result of 11 days' crushing at the Enterprise mine, East Fork. The ore was crushed in a five-stamp mill. Tbe company, which is composed of J. L. Day, J. R. Balch and Chas. Lobdell, are naturally highly elated over this good showing. A well-defined ledge, 18 inches to 4 feet in width, has heen struck in the mine. The ore is very rich, and frequently cleanups like the one mentioned may be expected.

NEVADA.

Ferguson District.

Lode: The small amount of work done in Ferguson district has demonstrated the fact of true fissure veins running through the country, with pockets and kidneys of high-grade ore. These deposits are found in the quartz between tbe quartzite and porphyry. From the beginning of the mineral belt, which commences a little west of the Monkey Wrench mine, at which point the lime formation ceases, we find a section demanding the most careful study. Apart from the Magnolia, the other ledges are similar in character, and require frequent tests and careful attentiou. In many instances the ore taken from one mine, tbough similar in character, varies greatly in the assay value. In some cases the manganese accompanies the pay ore, and it is not uncommon to find veins running in opposite directions, but dipping toward the main lode. The mineral helt seems to run from the Monkey Wrench to the Gold Eagle mines, centering upon the Jim Crow, Monitor and April Fool groups, running northerly and southerly, and heing several hundred feet in width.

Sterling District.

The parties who recently purchased the Sterling district mines have orgauized a company in Salt Lake, with a million dollar capitalization, to work the properties. It is reported tbere are several carloads of water pipe, besides other machinery, on the way from Salt Lake to tbe miues. The shares are of a par value of $10 each, and the officers of tbe company are as follows: Orsen Smith, president; J. E. Langford, vice-president; Hugh J. Cannon, secretary and treasurer. These, with the additiou of A. H. Woodruff and Hyrum Smith, form the directory, who will serve until July 1st, 1895. The properties consist of ten mining claims, situated in Sterling and Montgomery districts, Nye county, being formerly owned by Mackay Bros. and John Roeder.

COLORADO.

SMELTING IN THE SAN JUAN.—Rico *Sun:* The plants of the San Jnan Smelting and Miniug Co. and tbe Standard Smelting and Refining Co. at Duraugo have been supplemented by the two matte furnaces of the Rico and Silverton smelters. The Silverton smelter draws its main ore supply from Red Mountain mines. These—the Guston, National Bell, Yankee Girl and others—produce mainly one class of ore—a low grade copper hearing pyrite. Of such ore there is enough hlocked out in two of the Red Mountain mines to supply two or three matte furnaces of the Silvertou smelter's capacity. It is probable, however, tbat there will he difficulty in obtaining a sufficient quantity of silicious ore. The Silverton mines carry for the most part either small veins of higb grade ore or large lodes of lead-hearing ore—both classes of material heing unsuitable for fire concentration by matte smelting. In Rico the reverse conditions obtain. There is a good supply of low grade silicious ore hut a dearth of copper-bearing pyrite. This want has been remedied by the shipment of ore from Red Mountain. The Yankee Girl mine is sending ahout three cars per week to Rico from Red Mountain, through Silverton and past the very doors of the Durango smelters. Turning to the latter we find that their receipts of ore are such as to permit of the operation of only a small part of their plant. Tbe San Juan smelter was compelled during the past week to use sandstone in lieu of silicious ores. As to the Standard it has been found that the supply of copper ore is so uncertain that though originally intended to he exclusively a copper plant it has heen fouud advisable to add a lead furnace.

IDAHO.

PLACERS AT WARRENS.—Lewistou *Teller:* Ex-Governor N. B. Willey has made a sale of a large tract extending up Meadow creek from near the mouth of Steamboat to the hamlet of Warreus. In all, about 130 acres of placers are iucluded in this deal.

Of individual holdings iu the tract, the largest are probably those of George Riehold, embracing forty-seven acres, and including, amoug other claims, the old Bill George that paid handsomely. From this the richest pan of gravel in the district was obtained—ahout $32 worth of gold. Daily cleauups of $545 were made on this claim on a short run after the regular season was ended, the gravel being thawed out by fires. When Mr. Willey first went to Warrens in 1864 he bought an interest in the old Empire claim, in the bed of the creek, and from wbich he and his partuer took out $80,000 iu a few years. They sold it for $2000, thinking the claim worked out, hut the purchasers recovered $100,000 in gold from the same ground in seven years.

PLACER MINING ON PAYETTE.—Boise *Democrat:* The hanks of the Payette are lined from Emmett on up with men rocking for gold and making from one to four dollars per day. The best dirt will he found when the river is at its lowest stage, the miners following down the receding water with their rockers. Several different kinds of rockers are used, some having copper plates, some hurlaps, some blankets, etc. Like the Snake river product, the dust is so fine that considerahle of it is lost. It is so light that a grain of it apparently big as the head of a pin left in a pan to dry will float when water is poured in. A spot may prospect well this year, and he far richer or give up nothing the next. The high water deposits the lighter particles on the banks and hars, while the heavier is left here and there on the hottom of the river. It is on this theory that steam dredges were introduced on the Columbia, and their success led parties to commence preparing to give it a test at Marsh, ten miles above Emmett. The company is now hauling the lumher for the purpose of huilding dredges, etc. They say, however, tbat the ground which they recently honded prospects well enough to justify them in taking hold without working the hottom of the river.

DREDGERS FOR PLACER MINING.—*World:* The two mining companies who have bought placer ground at and near March & Ireton's have ordered 100,000 feet of lumber and bargained for 150,000 feet more. Boats are to be constructed with the lumber. Placer mining with hoats will he new in Boise county. Steam dredgers will be used and the dirt lifted onto the boats. This company will work the hig flat ahove Marsh & Ireton's, They will begin at the river and, of course, as tbe ground is worked the water will flow in to fill the space of the removed ground, and the hoats will constantly be able to float as the work goes on. Twenty tons of coal per day will he required.

NEW MEXICO.

COCHITI DISTRICT.—Cochiti *Call:* Machiuery for the Bailey stamp mill at Allerton is all on the ground and is being put in place.

Rich veins of gold ore that underlie Gold Hill continue through Colla, Pino and Medio Dia canyon and cover a territory at least five miles square. A majority of the rich strikes made the past ten days have been made outside of Gold Hill.

SOUTH DAKOTA.

GOLDEN REWARD.—Deadwood *Times:* At the recent meeting of the directors and principal stockholders of the Golden Reward a large amount of business was transacted, of interest not alone to the company but to the Black Hills in general, chief among which was the decision to double the capacity of their works by the erection of a cyanide plant capable of treating 100 tons per day, plans and specifications for which are now nearly completed. The crushing capacity of the present chlorination works will be increased by the addition of a uew building now under construction to accommodate new sets of rolls and screens.

It is not yet known whether the MacArthur-Forrest process will be adopted iu the new works or not. Experiments were made last fall by the Golden Reward Company relative to the precipitation of mineral from the cyanide solution to or on copper plates hy means of electricity; the test was on a small scale but proved eminently satisfactory. Should this method be adopted, it will revolutionize the cyanide process in the Black Hills at least, as by it the zinc shavings used in the MacArthur-Forrest process are entirely done away with, thus reducing the cost of treatment to that extent. Tbe Golden Reward Company have an immense reserve supply of ore in their various mines, carrying gold and silver in almost equal proportions, none of which the company have attempted to treat in their chlorination plant from the fact that the gold only could be recovered by that method. The mines controlled by the company have an unlimited supply of pay ore in sight, and instead of diminishing as the work progresses on them, the shoots become larger and better defined. The new works will necessarily increase the number of employes hoth at mines and mills, and thus benefit the entire commuuity by a large increase of tbe monthly dishursement on labor account, as well as material and supplies obtainable from our local merchants.

MONTANA.

GRANITE BUTTE DISTRICT.—*New Northwest:* A recent clean up after a two weeks' run at the Prize mill, near Granite Butte, in the northern part of this county, resulted in a $6000 retort. Tbe mine has been developed to a depth of 200 feet and drifts are heing run on both tbe 100 and 200. The vein is described as a true fissure varying in width from three to eight feet. Granite Butte is comparatively a new district, the first locations haviug heen made in 1890.

SUCCESSFUL ENGINEERING.—Phillipsburg *Call:* Friday morning the two crews working east from the Boca tunnel and west from the Bimetallic Extensiou shaft on the Bimetallic drain tunnel, came together aud shook hands. This completes the first division of the immense tunnel, a distauce of about 1200 feet, aud work east and west from the Parnell, and east from the Extension and west from the Granite is beiug pushed. The tunnel is the largest in the State. It will be 7000 feet in length when completed, which will be some four or five months yet.

STRIKE IN THE SPOTTED HORSE.—Another rich pocket has been encountered in the Spotted Horse at Maiden, if current rumor is to be relied on. The ore therefrom is said to run from $10,000 to $13,000 in gold per ton. So far, the extent of the hody is not known, though sufficient work has been done to demonstrate it is quite large. During the past ten days more than $150,000 has heen removed. But two men are at work taking out the ore, and the average is $15,000 per day to each man. This ore is not worked at the mills, hut is shipped to the Ompha smelter.

UTAH.

DELAYED WORK.—The railroad strike will greatly retard the rehuilding of the new mill and hoisting works at the Horn Silver mine. The timber on hand is ahout used up, and no certainty when more can be secured. There is also a car of machinery from Chicago en route, which is tied up somewhere.

The company has been delayed in securing lumher ever since the floods in Oregon, which shut off that supply, and having arranged for it from another source, the railroad strikes delay that.

The entire force of carpenters and the laborers will have to be laid off until the lumber is received. The force to be laid off will be ahout eighty men.

Salt Lake Herald: The late trouble at the Keystone mine in the Yellow Pine mining district over the thefts of ore ended in nearly all the men being discharged and replaced by new ones. The company at present is working about thirty men, and the mine to-day looks hetter than it ever did. The workings are down 400 feet and in the hottom the ore is of a higher grade for average than that of the upper workings. Tbe Keystone Mining Company has also two other valuable mining claims situated in Shadow mountain about thirty miles from Keystone and in California, across the line. Two men took out twenty tons of ore in a week's time, and teams have commenced to haul ore from here.

Upon tbe showing made by Professor Vincent, the English directors of the Flagstaff Mining Compauy recently ordered an increase in the capacity of the works at the mine of the company in Little Cottonwood canyon, and this work is now under way. Part of the new machinery is now upon the ground and the remainder will he delivered hy the time it is wanted. It was the original intention of the company to make an even greater increase in the works than that now under way and probably erect a mill, hut on account of the fluctuations and downward tendencies of hoth silver and lead, the more moderate policy was the one accepted. A good force of men has been at work without cessation and the idea is to increase the developments as soon as the new machinery is placed and the necessary repairs have been made. There is now on hand a considerable quantity of ore on the dump and shipments are to he resumed at once. The Flagstaff is one of the famous mines of the Territory and is owned entirely by foreign people, many of whom have never seen tbe property and know no more of it than they do of Central Africa, contenting themselves with the statements of their agents.

An important strike has been made in the Forlorn mountains, Ferguson district, situated southwest of El Dorado canyon on some old claims that were located some eight years ago and ahandoned. About the latter part of April John Heus, with another party, went to the old claims and got some ore from them which they had assayed for gold and which went very high. Other samples were then taken, all running from $10 to $600 in gold to the ton. There are four parallel ledges and all well defined, the belt is small, being about one mile wide and three miles loug. At present some ten locations are made. On the capital mine two shafts have been sunk, one twenty feet aud the other twenty-three feet and about seventy feet apart. The vein is two to two and a half feet wide and averages the same in both shafts, $41 in gold to the ton.

W. M. P. M. CO.—*Tribune:* The West Mountain Placer Mining Company has a force of men at work on its property in Bingham

canyon. The shaft is down 70 feet, where water is encountered, but the intention is to go to a depth of 150 feet to bedrock, and from there run drifts into the gold-bearing ground.

Mercur.

SUNSHINE AT THE SUNSHINE MILL.—The ore body is now blocked out on three levels, the lower of which is 160 feet from the surface. The ores are fully up to camp average, and little more can the plucky owners ask. At present developments are progressing with three shifts.

Park.

COMSTOCK RESUMES. The Comstock mine has resumed with a force of 20 men.

THE UINTAH DISTRICT. *Herald:* Miners returned from the new gold district in the Uintah mountains near the eastern line of the Indian reservation stated that the excitement was intense. Miners are flocking from every section of the country. Some finds have been made. The troops at Fort Du Chesne were called out to quell disturbances among the Indians. A small war was threatened.

MERCUR DISTRICT. The Marion mill made another cleanup the first of the week. After extracting the quicksilver the product was shipped East.

The Mercur Company are preparing to reduce their product to bullion before it leaves the mill.

The tanks are being placed in position at Geyser, and the operators will soon commence leaching that portion of the ore which can be worked without crushing.

The management of the Mercur report the last half of June run on the property the best that has ever been made by this bonanza. The amount of ore handled went ahead of all records. Bi-monthly dividend of $25,000 is due in August.

COPPER PLANT SHUT DOWN.—*Tribune:* The suspension of work on the copper plant is depriving labor at this time of about $35,000 a month, the pay roll for labor having reached that figure during the month of June.

In the absence of materials which are now tied up in the strike, the management says there was positively nothing for the men to do, and when day dawned yesterday morning it was upon a deserted plant, the pay roll at the property now consisting of a day and night watchman.

No one feels the blow more keenly than does the company itself, which is now in condition to produce 200 tons a day from its own mines. President Green, who is long past due here, is reported in Milwaukee, while Mr. Singer is tied up at some point on the railroads.

WYOMING.

GOLD AND COPPER FIND.—A rich discovery has been made in the Gold Creek country that is exceedingly rich in gold and copper. The paunings show it to be the richest find yet made in that section. C. H. Steel, the discoverer, claims it to be the richest ever found on the Sweetwater.

BALD MOUNTAIN ELECTION. The Bald Mountain Mining, Milling and Investment Company of St. Joe, Mo., at its annual in Sheridan, elected Paul Francke, president; G. M. Hahl, vice-president; M. F. Meyers, secretary; F. A. Moore, treasurer. It is the intention to put in two stamp mills at their Bald Mountain camp this season.

Bucyrus Steam Shovel on the Chicago Drainage Canal.

The construction of the great Chicago Drainage Canal is attracting the attention of the entire country, and much interest is being manifested in the machinery employed in the work. The steam shovels for excavating have been furnished largely by the Bucyrus Steam Shovel & Dredge Company of South Milwaukee, Wis., who have now fourteen shovels of their make on the work and are constructing five more for the same purpose, which will be ready within a few weeks.

This will make a total of nineteen Bucyrus steam shovels employed. The Bucyrus Company is just now a very busy concern. It recently secured orders from McArthur Brothers Co., contractors on the canal, for two other shovels, one of which will be the largest and most powerful machine of the kind ever built in this or any other country. Four steam shovels of the same magnitude and pattern have also been ordered from the company by Messrs. Griffiths & McDermott.

"In addition to these," state the company, "we have a number of other large orders on our books for dredges and steam shovels. We are increasing our force as rapidly as possible and working overtime. We have no reason to feel discontented with the times."

THE large placer mining plant on the Umpqua river, near Myrtle creek, Or., will soon commence operations with a 150-horse power boiler and pumping apparatus, which will force 24,000 gallons per minute through a 2½-inch nozzle.

Mechanical Progress.

Forging with a Hydraulic Press.

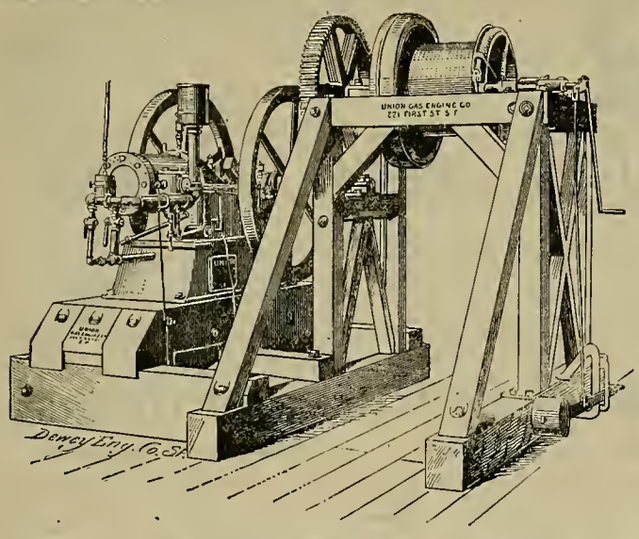
It now lacks just two years of being a century since Bramah first constructed a hydraulic press, working on the principle that if cylinders of different diameters be connected with a pipe the power exerted by a piston upon water in the smaller one would be multiplied in the action of the larger one in proportion to their areas. If the one had only a single inch of surface and the other 100 inches, then 250 pounds pressure in the first cylinder would produce in the other 25,000 pounds, or about 12 tons. But the stroke in the large cylinder, of course, would be only one one-hundredth as long as that in the pump. Such apparatus has long been used to squeeze cotton and hay for baling, to bend steel plates to a curve or a special pattern, to test the strength and tightness of boilers, to operate elevators and do much other heavy work. Sir Joseph Whitworth, the eminent British gun founder, introduced this system into his establishment some years ago for two purposes. He compressed fluid steel thereby, in order to render it more sound, and then he forged gun-tubes and steamship shafts in a hydraulic press, holding the soft metal on a stout mandril or cylindrical bar, slipped through a hole that had been bored in the ingot while the latter was cold. Much skill, however, is required in such forging in order to keep the white-hot steel from adhering to the mandril. Hydraulic power is also extensively used at present in making armor plate.

In a plant, described before the Iron and Steel Institute, the force-pump cylinder contains two plungers which approach each other simultaneously at each stroke. Escape through the connecting pipe and entrance to the press cylinder are effected without valves, although such appliances are required elsewhere. In this machine there is a pressure of three tons to a square inch. The piston which actuates the hammer or ram has a diameter of 30 inches, although the shank consumes part of its area; and the total force exerted when the ram descends toward the anvil is 1700 tons! More recent presses for this class of work have a capacity of 2000, 5000, 7000 and even 14,000 tons!

Utilizing Waste Steam.

During the past year the railways of the United States paid $7,000,000 to maintain the 10,000 water stations in this country. This expense, it is claimed, will be saved by the automatic tank now coming into use. This tank is actuated by steam from each locomotive as it stops for water—steam that would otherwise be wasted, as almost every locomotive while taking water blows off steam representing sufficient power to elevate a tenderful of water. There is nothing to do in operating the tank but for the fireman to turn on steam, which starts the flow of water into the tender, and to shut it off when the tender is filled. The next locomotive may be brought to the tank at once, a full supply of water being always ready.—Railway Age.

CARBORUNDUM, a substance approaching the diamond in hardness, and which has come into use in the arts to replace emery, is made by mixing together fine coke, sand and salt, packing the mixture round a carbon rod in an oblong box of fire brick, and connecting the ends of the carbon core with the terminals of a transformer, which raises the mass to a white heat. On breaking up the mass, the crystals of carborundum are obtained, bluish or yellowish-green in color, and varying in size from microscopic dimensions to several millimeters in diameter, and containing 30.49 per cent of silicon and 62.26 per cent of carbon.—Georgetown Courier.



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Electrical Progress.

Car Lighting With Electricity.

Most trolley cars are lighted with electricity, the current therefor being supplied through the overhead wire from the power station. Although the trunk line railways, and especially the sleeping and drawing-room car companies, are ratber more given to providing such luxuries than the street-car companies, yet there have been difficulties in the way of supplying the necessary electricity. If storage batteries alone be resorted to, great weight and bulk would be required to furnish energy for a 24-hour or 36-hour trip, like that from New York to Chicago or St. Louis, or else frequent renewal of the cells aloug the way, which would consume time, would be necessary. It has therefore been deemed wiser to put a dynamo in the baggage car and generate the current in tbat manuer. However, as this is liable to get out of order, and as it may be necessary to stop it for other reasous, it would not do to counect the machine directly with the lamp circuit. Storage batteries would need to be interposed, so that there might be a greater or less accumulation of energy between the origiual source and point of consumption. These batteries, though, need not be very large.

One plan that has been tried in this connection is to use steam drawn from the locomotive boiler, which means an additional, though small, engine in the baggage car, and that is not altogetber satisfactory. Another very natural scbeme is to take power from an axle; in fact, to reverse tbe operatiou going on under a trolley car. There a current comes in from above aud drives a motor, which gears directly into the axle, compelling it to revolve when the electricity is turned on. But in steam-car lightiug the revolution of the car axle drives a dynamo by gearing iuto the armature of the latter, and this excites tbe current, whicb is then led up into the baggage car through suitable wires. This system bas already been tried on two private cars with good results. Still another plan whicb has been tried within the last few montbs puts tbe dynamo up above the car floor and brings power thereto from the axle by an ingenious belting, which adjusts itself to any twists and turns of the truck. American cars have a swivel between the coach frame and truck, but foreign cars are rigid at this point of juncture, and do not present the same difficulty in taking power from an axle. The whole matter of electric ligbting on trunk lines is yet in an experimental stage, but it may emerge tberefrom before mauy months.

Electric Signalling at Fires.

Precious time is often wasted in passing word along from the nozzle-holders to the engineer or captain of a steam fire engine, or to the man at the hydrant, when firemen are in service. This is particularly undesirable when an attempt is being made to throw a stream from the top of a ladder into a six or seven story window. In tbat case, somebody mnst clamber down to the street and then work bis way along several huudred feet, in order to ask for water or increased pressnre. Meantime the flames may be making tremendous headway. Au electric signal, invented to do this work instantaneously, was tried in Boston the other day in the presence of insurance experts at the Fire Department headqnarters. A pusb-bntton, like that commonly used with electric call bells, was inserted in the brass coupling next tbe nozzle, and a wire was introduced iuto each length of bose in sucb a way as to establish connection along the whole line. The bell was attached to the engine and was operated by a small "dry battery." Electric connection, of course, had to be made at each junction of two sections of hose, and this was accomplished merely by screwing the brass conplings together. Everything worked beautifully ou tbis occasion, altbough the witnesses were unable to tell whetber the apparatus could always be relied upon. It is customary to shut off water uow by a cock in the nozzle. But a system of signalling like that here described makes it possible to have the pressure removed more promptly, and thus save the strain on the hose.

Incandescent Electric Lights for Street Illumination.

Prof. W. A. Anthouy, formerly of Cornell Uuiversity, has been making forcible objection to some of tbe methods in vogue for the subdivision aud distribution of electric light or other artificial illuminatiou. He is decidedly in favor of the small unit or incandescent lamp as compared with tbe large unit or arc, whether we consider the illumiuation of a large space or ordinary street linear ligbting. Remembering tbat nine 16-candle power incandescent lamps can be run with the power required for one 405 Watt arc lamp, the arcs must be nine times as far apart as the incandescent consuming the same power, and to give the same illumination must be 81 times as intense, or about 1300-candle power. But in no arc lamp as used for street lighting do tbe rays proceed toward the more distant points to be illuminated reach more than a quarter of such intensity. Prof. Anthony expresses his opinion that tbe location of arc lamps at iutervals of 1000 to 1600 feet, as they are ofteu seeu in preteutious villages or suburban towns, is an entire waste of money. Incandescent lamps at intervals of 100 to 200 feet, run by the same power, would give a far better illumination. It is curious to note that frequent attempts bave been made at street lighting by iucandescents, but uniformly without great success; and that meanwhile it is a rapidly spreading practice to use the Edison mains, ordinarily employed for iuterior lighting, for the further service of arc lights on the streets. New York, Brooklyn, Boston and other cities have to-day thousands of arc lights burningin this way at low and perfectly safe potentials.

The Lamp of the Future.

Neither of the two forms of lamp now in common use for electric lighting yields all tbe results that could be desired. The arc concentrates the illumination too much; the incaudescent burner, while subdividing it, is wasteful of energy. It develops heat, and this is a net loss. Some of the most eminent of living electricians are trying to find a practicable and economical way of imitating the glowworm and firefly, by generating phosphorescent gleams devoid of warmth. Tbis was accomplished years ago with Geissler's tubes, in which an interrupted current was sent through wbat amounted almost to a vacnum. An attempt to iutroduce a lamp based on this principle into the market in London over a year ago created a brief sensatiou on both sides of tbe Atlantic; and much more promising experiments in the same direction have been made in this country and abroad by men of high reputation, but thus far the goal bas not beeu reached. The phosphorescent lamp at present requires currents of too high potential and frequency of alteratiou to be econmical.

A CONTRACT amounting to about $225,000 has been awarded an electric company for the complete eqnipment of the Metropolitan elevated road of Chicago, witb power plant, geuerators and motor cars. It is said that figures show a saving of about $200,000 a year in the operation of the road by electricity as compared with steam locomotives.

THE *Electrical Review* uow says: "Economy seems still to be the order of the day. We know one central station man who says be has bought no supplies for three months, and will probably buy none for three months to come."

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Practical Information.

Lights in the Ocean's Waters.

The suulight only penetrates a short distance below the surface of the ocean, and were it not for a wonderful provision of nature the depths of the sea would be as dark as Erebus. The deep-sea animals and many that live near the surface are furnished with light-giving organs. One of the most familiar of the phosphorescent animals is the noctiluca. If the hand be drawn through the water of the tropics at night and a watch be held within a few inches of it enough light will be emitted to see the face clearly. In the Pacific one can see numerous luminous fishes darting about the surface.

Nearly every group of animals may be said to contribute lights to the ocean depths. Upon a dark night the voyager can see near the surface numerous jelly fishes, almost invisible during the daytime, but gleaming theu with a mysterious light that is heatless and cannot be explained. Farther down can be seen great disks of jelly shining with a faint yellow light, like moons; others with long tails, like comets. At the bottom of the deep sea, where the temperature is almost freezing, nearly every animal is a light-bearer. The fishes are the most remarkable. The pressure is here so great that glass is powdered, and wood crushed out of all semblauce to itself. The auimals withstand the great pressure because their bones are cellular and porous, like great sponges. The echiostoma, a fish found in water 13,000 feet deep, is provided with lumiuous spots arranged about the eyes, which undoubtedly supply sufficient light for all its purposes. The steuptyx is luminous over its entire surface. The stomias, a ferocious, snake-like creature armed with fang-like teeth is furnished with rows of light which surround it like an aureola. The malacosteus has lights on its head, one emitting a golden and the other a greenish tint. A species of shark gives out a greenish light.

The floor of the ocean is carpeted with luminous forms. The starfishes that are lifted by the dredgers are often lumiuous over the entire surface. The most remarkable light-giver of the deep sea is the umbellularia. They form a forest on the ocean bottom that would appear, if we could get them to see, like a waving cornfield with every leaf flashing with light. This animal is found several miles below the surface. Ascending near the surface we find in the southern seas the pyrosoma, which is hollow aud columnar in form. Vessels sailing through schools of these animals seem to be plowing through liquid fire.

The Paper Lamp Shade.

According to a writer in the *Times*, paper colored with chromate of lead may be subject to spontaneous combustion, and this had, he says, taken place with a paper lamp shade. For two days prior to the accident the lamp, a duplex, had not been lighted, and there had beeu no fire in the room. Since the morning of that day, when the room was dusted and the shade apparently in its usual condition, no one had entered the room. The shade was made about a year ago from so-called crinkled tissue paper, one white and one yellow sheet, gathered together at the upper part where it was fixed to the wire frame, where it formed a considerable bunch, and spreading thence to the frame below. On examinatiou the yellow paper was found to be colored by chromate of lead, and this, uo doubt, was the cause of the accident. There cau, he thinks, be no doubt that this was a genuine case of spontaneous ignitiou, though he has not as yet been able experimentally to reproduce the necessary conditions leading to such a rest. The dangerous paper is readily recognized by setting fire to a piece of it and blowing out the flame. In the case of ordinary paper it will be fouud that the glow along the burnt edge is very soon extinguished, whereas in the case of these chromate papers it continues until the whole is consumed, as is the case with ordinary touch paper. He fiuds that, besides the yellow paper, pale green paper also contaius chromate of lead, and would no doubt be equally dangerous, and possibly there are other colors containing the same material.

Solar Suction.

At a recent meeting of the Engineers' Club of Philadelphia Joseph T. Richards made some interesting remarks on the actual work of lifting performed by the sun's rays in the absorption of water through the atmosphere. He said: "For many years past I have been much interested in matters relatiug to the composition of the atmosphere and the work done by the sun in raising the moisture afterward precipitated as rain. Professor Loomis claims that the average height of clouds is two miles. Although this is probably correct, I think there is no doubt on the other hand that many clouds from which we see rain falling are within half a mile of the surface of the earth. To make a moderate calculation, let us assume as a minimum distauce 3000 feet. If you figure it out, you will find that a rainfall of one inch an hour would amount to 72,600 tons of water deposited on each square mile, to elevate which 3000 feet would mean an amount of work equal to 220,000-horse power. To raise this water in an hour by pumpiug eugines giving a duty of 100,000,000 cubic foot pounds would require the consumption of 200 gross tons of coal. I think this will help us to appreciate the immense amouut of work being done by the suu in storing up our natural water supply. If the average elevation of Philadelphia is 84 feet, then we have 4517-horse power developed for each square mile for a rainfall runoff in an hour. When those quautities are considered the wouder is that when we have such downpours as that which caused the Johnstown flood the damage is not much greater than it was on that occasion."

LIKE all other metals, except iron and platinum, aluminum combines with mercury, forming an amalgam. The properties of this amalgam are quite remarkable. While aluminum itself is practically not oxidizable, the amalgam is energetically attacked by air and water. Even the slightest combination of mercury with the metal is sufficient to produce this result. The amalgam rapidly decomposes water, liberating the hydrogen and developing a measurable degree of heat.

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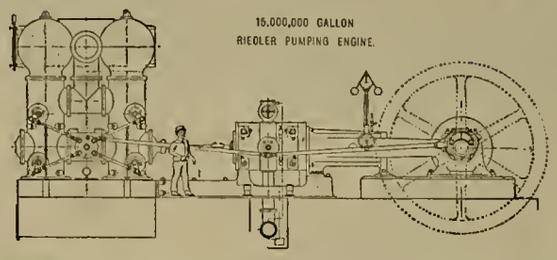
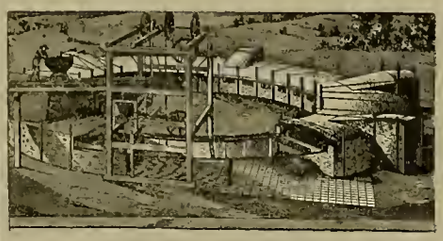


Let us book your address to receive this on publication.



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P. & B. ROOFING.

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SUCCESSFUL

Everybody Wants It!

Will pay for itself several times a year, saving

Turpentine,
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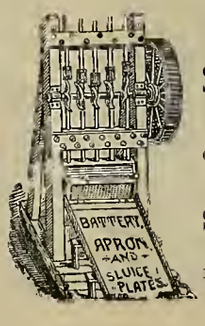

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Silver Plated Copper Amalgam Plates

For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
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E. G. DENNISTON, - - - - - - - - - - Proprietor.
Every description of work plated. Send for Circular.

Market Reports.

The Markets.

SAN FRANCISCO, July 26, 1894.

The London price for silver on the 25th was almost 28 15-16—the highest for the month. There is little change to note in that or other metals. Despite the low price of copper, some mines producing that metal are able to declare dividends. The Quincy Co., of Michigan, has declared a $4 dividend on each of its 50,000 shares, payable next Wednesday. That is the second $200,000 dividend this year, and makes a total of $7,070,000 in dividends paid by that mine.

New York Prices.

NEW YORK, July 26.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	28¼	62¼	....	....	....
Friday	28⅝	62⅝	9 00	3 10	19 40
Saturday	28⅝	63⅝	9 20	3 12½	....
Monday	28⅝	62⅝	....	....	....
Tuesday	28½	62½	9 20	3 10	19 25
Wednesday	28⅞	62⅝	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	15c
London Bankers', 60 days	$4.88
London Merchants	$4.86¾
London Sight Bankers'	$4.89¾
Refined Silver, per ounce	62¾
Mexican Dollars, nominal	52@52½

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¾
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2¼
Norway, base	—	@	4½
PIG IRON.			Spot.
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	—	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	— —	@	— —
Clay Lane White	22 50	@	— —
Langloan	22 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	22 50	@	— —
Cargofleet	— —	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10
QUICKSILVER.			
Home trade, per flask	35 75	@	36 00
STEEL.			
English, lb	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lb	23	@	23¼
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			6 00
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			7 75
Brymbo			7 25
West Hartley			7 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 50	@	— —
Cardiff	7 50	@	— —
Lehigh Lump	17 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	9 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

An item has been appearing in nearly every mining paper, copied from the Glenwood, Col., *Echo*, saying "a carload of silver ore was shipped by the Smuggler mine that was worth just $400,000." A few figures will show that even the famous Eberhardt ore from White Pine couldn't stack up enough to make near that amount. A carload of twenty tons of pure silver would he at an outside figure 583,000 ounces Troy, which at current rates would be worth $360,000. If the carload went 50 per cent pure silver it would he worth $180,000, which would he uncommonly rich. By the time such stories get over to England it is made to appear there that the silver miners of the West hlast solid silver out in ton chunks, thus thwarting all righteous effort toward remonetization.

THERE is a prospect for quite a mining boom at Meadow Lake this fall. Many locations have been made by the people of Sierraville recently, says the *Leader*. Two firms, one in Denver and one in San Francisco, have bonded mines there, and both have discovered processes whereby the rebellious ores of that locality can be worked.

Mining Share Market.

SAN FRANCISCO, July 26, '94.

There was a noticeable improvement in the market this week. Con. Cal. and Va. figure a profit on Juue workings of $50,000, though that has very little to do with the quotations of its stock. The Bodie Consolidated is out of debt and has $32,000 in coin and 10,500 shares of capital stock in its treasury. The California is out with a hullion report for June showing that during that month the Morgan mill crushed 1916 tons, which yielded $108,079, of which $37,047 was gold. The yield was 92 per cent of the hattery assays. The Standard Consolidated of Bodie paid a $10,000 dividend yesterday.

The following illustrates the changes of the week:

MINES.	19	26
Utah	....	6
Sierra Nevada	$ 65	59
Union	42	59
Mexican	98	93
Ophir	1 90	1 90
Consolidated California and Virginia	3 45	3 25
Best & Belcher	1 15	1 05
Gould & Curry	50	48
Savage	35	26
Hale & Norcross	64	58
Chollar	30	25
Potosi	....	46
Bullion	....	18
Exchequer	....	....
Alpha	....	....
Confidence	95	....
Yellow Jacket	45	43
Crown Point	80	70
Belcher	77	72
Overman	....	10
Justice	....	15
Alta Consolidated	....	20
Consolidated New York	....	....
Challenge	38	34
Bodie	1 10	95
Andes	47	....

Dividends for June.

In the issue of the 7th inst. was given a list of mining dividends paid in June so far as it was possible to procure them, mail communication making it manifestly impossible to give a list even approximately correct. Newspapers from the interior of the State now arriving enable us to reproduce the list with closer approach to correctness.

The following mining companies declared dividends in Juue:

MINING COMPANIES' JUNE, '94, DIVIDENDS.

	JUNE.	Total for year '94.
Alaska-Treadwell, Alaska	$150,000	$300,000
American, Montana	....	21,658
Aspen M. & S. Co., Colorado	30,000	30,000
Bald Butte, Montana	25,000	100,000
Belden Mica, N. H.	5,000	30,000
Boreel, Colorado	....	500,000
Bullion B. & C., Utah	50,000	75,000
Central Eureka, Utah	....	15,000
Calumet & Hecla, Michigau	....	500,000
Champiou, California	3,400	20,400
Copper Queen Con., Arizona	50,000	150,000
De Lamar, Idaho	....	200,000
Elkborn, Montana	32,813	65,626
Elkton, Colorado	6,000	36,000
Franklin, Michigan	....	80,000
Golden Fleece, Colorado	12,000	72,000
Golden Reward, South Dakota	5,000	30,000
Golden Rule, California	5,000	10,000
Harqua Hala, Arizona	....	36,000
Helena & Frisco, Montana	....	15,000
Highland, California	10,000	25,000
Homestake, South Dakota	18,750	112,500
Hope, Montana	....	25,000
Horn Silver, Utah	50,000	100,000
Iron Mountain, Montana	....	20,000
Kennedy, California	48,000	288,000
Mayflower Gravel, California	10,000	60,000
Mercur, Utah	25,000	150,000
Morning Star Drift, California	7,200	45,600
Moulton, Moutana	....	20,000
Moose, Colorado	21,200	45,200
Napa Con., California	....	20,000
Omaha, California	7,200	25,200
Quincy, Michigan	....	200,000
Rico-Aspen, California	25,000	150,000
Smuggler, Colorado	50,000	350,000
Standard Con., California	....	20,000
Tamarack, Michigan	200,000	300,000
Trinity River Hydraulic, Cal.	....	12,500
Union, Colorado	6,000	12,250
Union M. Co., California	2,500	2,500
Victor, Colorado	15,000	45,000
W. Y. O. D., California	3,000	18,000
Zion M. Co., Nevada	10,000	10,000
Totals	$ 873,063	$4,033,034

Twenty-five mines paid dividends in May, amounting to $885,100.

It will he noted that in June twenty-eight mines paid dividends, as against twenty-five in May: that the June dividends aggregated $879,063, and that during the first half of '94 those mines paid in dividends the comfortable sum of $4,033,034,

San Francisco Stock Board Sales.

SAN FRANCISCO, July 26, 1894.

FIRST SESSION—9:30 A. M.

100 Belcher	69	500 Kentuck	12
800	70	100 Mexican	93
100 Bodie	95	200	92
200 Best & Belcher	1 05	50 Mono	20
150 Bullion	18	100 Ophir	1 90
100 Challenge	34	400 Overman	10
500 Chollar	25	150 Potosi	45
200 Con Cal & Va	3 25	50	46
1100 Crown Point	65	500 Savage	26
100	64	100 Sierra Nevada	52
500 Gould & Curry	48	50 Union	56
100	47	300 Utah	6
100 Hale & Norcross	58	100 Yellow Jacket	41
100 Justice	15	200	32

SECOND SESSION—2:30 P. M.

100 Alta	20	400 G & C	35
500 Belcher	75	100 Hale & Norcross	56
150	71	200 Mexican	92
100	73	200 Ophir	1 85
450 Best & Belcher	1 05	100 Sierra Nevada	59
100 Con Cal & Va	3 20	300 Union	59
300 Crown Point	69	300 Yellow Jacket	42
400	70	100	3 43

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delin't and Sale.	Secretary.
Eclipse M Co, Cal	8	2c	June 8,	July 10, July 31	Otto Tum Suden, 530 California
Evening Star M Co, Cal	14	1c	June 5,	July 14, Aug 4	J J Scoville, 320 Sansome
Gray Eagle M Co, Cal	37	5c	July 17,	Aug 24, Sept 21	C C Harvey, 309 Montgomery
Mexican G & S M Co, Nev	50	25c	June 12,	July 26, Aug 15	C E Elliott, 79 Nevada Block
Occidental Cou M Co, Nev	16	10c	May 31,	July 23, Aug 14	A K Durbrow, 69 Nevada Block
Osborn Hill G M Co, Cal	3	15c	July 7,	Aug 7, Aug 28	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17,	Aug 21, Sept 11	G D Edwards, 414 California
Seg Belcher & Mides M Co, Nev	14	10c	June 12,	July 16, Aug 6	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18,	Aug 22, Sept 11	E L Parker, 309 Montgomery
Union Cons M Co, Nev	49	15c	June 20,	July 25, Aug 15	C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Altoona Q S M Co, Cal	Special	C Allenberg, 630 Brannan	Aug 16
Yellow Jacket (Postponed)	Annual	G D Edwards, 414 California	Aug 2

Coast Industrial Notes.

—Adolph Sutro is goiug to build an electric road from Clement avenue in this city to the heach.

—Puget Sound lumher "is being sent to the South African colonies for use in the gold mines.

—It is reported that the California Jute Mills at Oakland, employing 400 people, will close down this week.

—Sixteen coal-laden vessels are uow on the way here from Australia, with twenty-six more entered to follow.

—The Forhes Wheel Company has incorporated. Capital stock, $300,000, of which $180,000 have heen subscribed.

—Columbia river canners estimate the salmon pack there will fall short by more than 100,000 cases, due to floods.

—The *Northwestern Lumberman* says the general distrihutive lumber trade is greater in volume than this time last year.

—During June, San Francisco exported 472 M ft. lumher, chiefly to Central America and Mexico. The exports for June, '93, were 1079 M ft.

—With a capital stock of $1,600,000. the Alcatraz Asphalt Company has incorporated, to deal in oils, asphalts, gas, water and mineral deposits.

—The Sau Francisco Coffee Company has filed articles of incorporation with a capital stock of $450,000, $275,000 of which is subscribed.

—A contract has heen let and work hegun on the new water works at Paso Rohles, Cal.; $12,000 will he expended in constructing a new reservoir.

—The Standard mill at Snohomish, Wash., employiug 100 hands. has been totally destroyed by fire, causing a loss of $60,000. The iusurance is $4000.

—The North Pacific Mining and Transportation Co. has incorporated in this city with $3,000,000 capital stock, of which $75,000 has beeu subscribed.

—From Jau. 1st to June 30th the total shipments of lumher hy cargo from Tacoma amounted to 19,984,719 feet—a decrease from the amount shipped in the first half of 1893, which was 37,476,436 feet.

—The San Fraucisco Board of Education has let a contract for the first trades school to he erected in this city hy the department. The building will he three stories in height, constructed entirely of hrick, and will occupy the vacant lot on the southeast corner of Bush and Stockton streets.

—In the United States Circuit Court judgment has heen given against A. W. Von Schmidt. who has been suing Bowers' patent hydraulic dredgers. It has been tedious litigation, and it is thought when the amount of assessed damages is made up it will aggregate $500,000. Bowers' career is an illustration of the fact that "keeping everlastingly at it hrings success."

—On shipping in '93 San Francisco levied $85,675 taxes, a sum within $600 of the comhined taxes paid by the Cunard Line, the Hamhurg-American Line, the North German Lloyd and the Compagnie Generale Traas-Atlantique to their respective governments, their comhined shipping comprising upward of 700,000 tons of the hest steel and iron steamships iu the world, valued at upwards of $58,000,000.

—P. Costello has the contract for the construction of the Middle Kittitas, Wash., irrigation canal. His hond is in the sum of $273,495. His hid in detail was: Solid rock excavation, $1 per yard; loose rock, 32 cts. per yard; earth, 10 4-10 cts. per yard; lumher, t. aud g., $17.40 per M.; lumber, rough, $16.40; earth excavation, tunuel, $1.54 per yard; loose rock, $3.74 per yard; solid rock, $6 per yard; lumher lining tunnel. $18.40 per M.; clearing, $22 per acre; gruhhing, $80 per acre; iron, bolts, etc., 4½ to 6 cts. per pound; concrete, $9 per yard.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Phillip Hayes in the Hayes & Steelman Mine near Gold Lake, Sierra Co., to deposit tailings on a flat in Mohawk Valley; from Stephen Soracco in the Mohawk Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in a ravine; from Frank F. Vanzini in the William Tell Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in Yankee Ravine; from Nicola Rossi and Peter Lorenzo in the Grizzly Bear and Garfield Flat Mines near Johnsville, Plumas Co., to deposit tailings behind dams in Squirrel Creek; from Reagan and Lowe in the Howard Mine near Ono. Shasta Co., to deposit tailings behind brush dams in a ravine; from T. H. Steel in the Steel & Co's Mine near Brownsville, Yuba Co., to deposit tailings behind stone dam on New York Flat; and from the Consolidated Amador Volcano Hydraulic Gold Mining and Land Co. of California in the China Hill and Elephant claims, to deposit tailings in Sutter Creek; gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., on Monday, August 13th, 1894, at 1:30 P. M.

Professional Cards.

WM. GILBERT, B. S., Manager.
PRACTICAL ENGINEERING SCHOOL,
205 Goodenough Building, Portland, Or.
Civil, Electrical, Steam, Mining, Assaying.
Full charge of plant taught. Circular.

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EXPERT DESIGNER of Special and General Machinery.
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W. N. JEHU, - - - - Proprietor.
Successor to Jehu & Ogden.
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Rooms 46 and 47 Montgomery Block.
Ore Assays, Analyses of Minerals, Metals and their Alloys, Etc.
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School of Practical, Civil, Mechanical,
Electrical and Mining Engineering,
Surveying, Architecture, Drawing and Assaying.
728 Market St., San Francisco, Cal.
OPEN ALL YEAR.
A. VAN DER NAILLEN, President.
Assaying of Ores, $25; Bullion and Chlorination Assay, $25; Blowpipe Assay, $10. Full Course of Assaying, $50. Established 1864.
☞ Send for Circular.

Nevada Metallurgical Works,
No. 23 Stevenson Street.
Near First and Market Sts., San Francisco.
C. A. LUCKHARDT, Manager.
Established 1869.
ORES WORKED BY ANY PROCESS.
Ores Sampled.
ASSAYING IN ALL ITS BRANCHES.
Assays of Ores, Minerals, Waters, Etc.
WORKING TESTS (PRACTICAL) MADE.
PLANS AND SPECIFICATIONS furnished for the most suitable process for working ores.
SPECIAL ATTENTION paid to examinations of mines; plans and reports furnished.
C. A. Luckhardt & Co.,
(Formerly Huhn & Luckhardt),
Mining Engineers and Metallurgists.

Everette's Mining Office.
(Pioneer Mining Geologist's Office of the Pacific Northwest.)
MINING LAW, MINE EXAMINATIONS, METALLURGY, ASSAYING AND ANALYSIS.
"Consulting Associate Mining Attorney at Law."
Will examine and report upon "Title and Exact Value" of Gold, Silver, Lead, Copper, Coal, Iron, Clay or other Mineral Properties IN ANY PART OF THE WORLD. Any information mining men may desire to know, relative to the MINERAL or COAL resources of the entire Pacific Northwest, will be honestly given.
Dr. Willis E. Everette,
1318 E Street,
Tacoma, State of Washington, U. S. A.

Almarin B. Paul, M. E.,
Mining Operator,
ROOM 5, CROCKER BUILDING.
Cor. Market and Montgomery Sts., San Francisco.
OFFICE OF
California and Nevada G. & S. Extraction Co.
Shasta Gold Extraction Company.
Comstock G. & S. Recovering Co.
Agency for the CYANIDE PROCESS
For the Counties of Shasta, Trinity, Siskiyou, Inyo and Mono, California; Esmeralda, Storey, Lyon and Douglass, Nevada.
Plans and Estimates made for IMPROVED CYANIDE PROCESS PLANTS for Gold and Silver Extraction, and competent instruction for successfully working the same on a large, practical scale.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 10, 1894.

522,585.—NUT LOCK—J. C. Brown, Santa Barbara, Cal.
522,822.—FOOD PRODUCTS—J. W. H. Campbell, S. F.
522,681.—SAW GUARD—Cote & Corbeille, Everett, Wash.
522,854.—TAPPING MACHINE — M. Crawford, Jr., Stockton, Cal.
522,785.—FRUIT JAR—F. A. Dixon, San Jose, Cal.
522,787.—BOAT'S DAVIT — Ench, Fugel, Cooke & Schultze, Oakland, Cal.
522,593.—BLIND SLAT HOLDER — E. E. Hansou, Spokane, Wash.
522,841.—ELECTRIC BELT—W. E. Y Lawlor, Portland, Or.
522,965.—MAGAZINE GUN—A. Lee, New Whatcom, Wash.
522,980.—DOUGH KNEADER—I. Lobree, S. F.
522,993.—BOTTLE ELEVATOR—F. McLaughlin, Oroville, Cal.
522,704.—TRUSS—Robt. Nagler, S. F.
522,916.—HINGE—Noble & Buxton, Forest Grove, Or.
522,765.—HAIR CLIPPER—O. Olsen, S. F.
522,765.—WASHING MACHINE — C. A. Palmquist, Spokane, Wash.
522,767.—ROTARY DRIER—H. Rich, Corralitos, Cal.
522,768.—BUTTONHOLE PATCH—E. P. Roche, S. F.
522,916.—PIPE—J. & D. J. Shultis, Los Angeles, Cal.
522,827.—FRUIT PITTER—F. C. Stanford, Gilroy, Cal.
522,807.—AMALGAMATOR—G. W. Strong, S. F.
23,453.—DESIGN FOR PARLOR ARCH—W. A. Kemp, S. F.

FOR WEEK ENDING JULY 17, 1894.

523,055.—FRUIT CAR—D. E. Bartou, Los Angeles, Cal.
523,271.—CONDUIT RAILWAY — J. W. Eisenhuth, S. F.
523,319.—TROLLEY CONDUCTOR—J. W. Eisenhuth, S. F.
523,141.—PORTABLE BOOTH—J. W. Ernest, Los Angeles, Cal.
523,273.—GRIP BLOCK — G. S. Fouts, Aberdeen, Wash.
523,238.—JOINT AND BEARING—W. C. Rarig, S. F.
523,130.—EJECTOR FOR GUNS—G. A. Sachs, Eugene, Or.
523,111.—LARDER—J. Schade, Los Angeles, Cal.
523,185.—MACHINE GUN — P. B. Tyler, Spokane, Wash.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the pateats recently obtained tbrough Dewey & Co.'s SCIENTIFIC PRESS U. S. aud Foreign Patent Agency, the following are worthy of special mention:

FRUIT JAR.—No. 522,785. July 10, 1894. Frank A. Dixon, San Jose, Cal. This invention relates to improvements in hermetically sealed glass jars adapted to contain fruit and similar snbstances. It consists of a jar having a thickened rim projecting outwardly with a ground surface adapted to receive a gasket, an annular ring or flange aronnd the neck with grooved depressions on opposite sides, a cover fitting upon the gasket with a rim projecting below the top so as to form an annular channel for the reception of the sealing wax or material, when the jar has been inverted, and an elastic semi-circnlar ring adapted to snrround the neck of the jar below the annnlar flange, having arms projecting upwardly through the depressions in the flange and adapted to bend inwardly over the cover of the jar, the whole forming an improved seal and means for locking the cover in place.

BUTTON-HOLE REPAIR PATCH.—No. 522,768. July 10, 1894. Edward P. Roche, San Francisco, Cal. The object of this invention is to provide a readily removahle and transferahle repair patch which is easily applied whenever a button-hole breaks out unexpectedly, so that the article may be temporarily placed in a condition to be worn without makiug a permanent repair at tbe time. It consists of a strip of non-corrosive material, folded upon itself, so that its bight or folded edge fits over the edge of the garment, and its folded memhers clasp both sides of the portion of the garment through which the broken hutton-hole is made. These memhers have openings made in them near the center adapted to coincide with each other and with the button-hole of the garment so as to serve as a temporary buttonhole, and the device is provided with readily detachahle fastenings by which the free ends of the patch are secured to the garment at some point beyond the broken hutton-hole.

HAIR CLIPPER.—No. 522,765. July 10, 1894. Ole Olsen, assignor to the United States Hair Clipper Manufacturing Co., San Francisco. The object of this invention is to provide a hair-clipping machine having a hinge connection between the cutter head and the handles and a mechanism by which the cutter may he actnated from the handles in whatever position it may stand with relation thereto. It consists of two handles pivoted together, adapted to approach and separate from each other, a stationary toothed comh plate hinged to and turnable about the extension of one of the handles and a connection between the other handle and the movahle cutter plate wherehy the latter is reciprocated across the comb plate hy the opening and closing of the handles, while the comh and cutter plate are allowed to turn to any desired position with relation to the handles. The handles are closed together hy compression and are separated by the action of a spring suitahly fixed with relation to the hinge thereof.

ROTARY DRIER.—No. 522,767. July 10, 1894. Harrison Rich, Corralitos, Cal. This invention relates to that class of driers in which the material to he dried is carried upon supports which are suspended freely from the periphery of the horizontally rotating reel which is mounted within a hot-air casing. The invention consists in a means for suspendiug and coatrolling the carriers so that each may be readily swung outwardly beyond the periphery of the reel where they can be loaded and unloaded, or they may be swung inwardly and locked when in normal operation. It also consists in the normal construction of the casing hy which the carriers are readily manipulated, and the reel is made in a plurality of independent sections mounted upon a common shaft and adapted, by suitable clutches, to he engaged with and disengaged from the shaft so that any one of the sections may he arrested and discharged and reloaded without stopping the operation of the others.

FOOD PRODUCT AND APPARATUS.—No. 522,822. July 10, 1892. James W. H. Campbell, San Francisco, Cal. This iuvention relates to improvements in food products, and consists of a process for preparing the grain, and in devices constituting apparatus for carrying out the same. This consists of an elevator and a series of hoppers into which the various grains are delivered, raised by the elevator and discharged so as to fall from a considerable height through the atmosphere into a receiving bin or hopper, where the shock of the fall serves to destroy any germ life which may be found in the grain, and the grains, heiug thus first treated separately, are mixed and again treated in the same manner aud ground for use. This treatment seems also to add a certain amount of phospboric acid to that naturally contaiued within the grain, which is cousidered valuahle for food products.

AMALGAMATOR AND SETTLER.—No. 522,807. July 10, 1894. Geo. W. Strong, San Francisco, Cal. The object of tbis invention is to combine in a single apparatus means for first grinding and amalgamating the ore pulp, and means for afterwards separating and settling the valuable precious metals from the lighter worthless material in the pulp without removing the latter from the pan in which the grinding has heen done, and also in a means for securing the safety of any valuahle material which may he left unguarded within the pan. The pan may he of any usual or snitable form, having a muller or carrier, with mechanism by which it is rotated in the pan, shoes and dies within which the ore-bearing material is ground in the first part of the process, and means for raising the miller and shoes above the surface of the dies so that it will rotate ont of contact therewith for the purpose of settling and separating the lighter and heavier valuahle particles after the grinding has heen completed, the metal being also amalgamated within the same pan without any danger of the amalgam heing floured hy grinding. Mechanism is also employed hy which different rates of speed may he used for the grinding and settling and a device whereby the discharge openings are securely locked so that no material can he surreptitiously taken from the pan.

AUTOMATIC BOAT DAVIT.—No. 522,787. July 10, 1894. Frank Ench, Hugo Fugel and John L. Cook of Oakland, Cal., and Gustav Schultze of Berkeley, Cal. Said Cook assignor of one-half his right to John Dolheer of San Francisco. This invention relates to that class of boat or ships' davits in which the boat is suspended from arms or sections of the davits hinged or jointed and adapted to swing in order to carry the hoat inhoard or outhoard, the object of the invention heing to enahle an effective and rapid operation of lowering the hoat or again swinging it in place. It consists of davits having a lower fixed section, an upper swinging section jointed thereto at a point intermediate of the overlapping ends of the two sections and limiting stops formed hy an extension of each section, together with blocks of the upper sections, and hoisting lines or falls hy which the hoat is suspended from said blocks and guided downwardly, so that through the raising and lowering of the boat the upper sections are swung in and out automatically. With these is used a winding shaft, with drums to which the lines or falls are attacbed, and a retaining pawl or rachet for holding the shaft, together with a brake which is applied to the winding shaft to control the descent of the hoat when it is being lowered.

New South Wales Tin Production.

The New South Wales Department of Mines estimates the quantity of tin raised and exported from that Australian district during the 21 years ending December 30, 1892, in round figures at 121,912 tons. This total includes tin in the shape of ore and of ingots. Its production is becoming one of the settled industries of the country, the quantity raised depending entirely upon the prices realized. The manufacture of tin plates, however, is not yet on the list of New South Wales industries. All manufactured tin is imported and is extensively used for canning purposes. The quantity of tin plate imported duriug 1892 amounted to 62,078 packages, also 19,033 packages of tinware.

WHAT are believed to be indestructible flywheels are now being made, at the suggestion of F. P. Sheldon of Providence, from wrought-iron plates bolted together. A wheel of this sort has, instead of spokes or arms, a continuous web or disc, composed of two sets of six sections each, made to overlap and break joints, and bolted to each other and to the rim. The latter is also made in segmeuts.

THE Rosebud mill, at Cripple Creek, Col., owned by a French company, was burned last Monday. The loss is $150,000, partly insured in this city.

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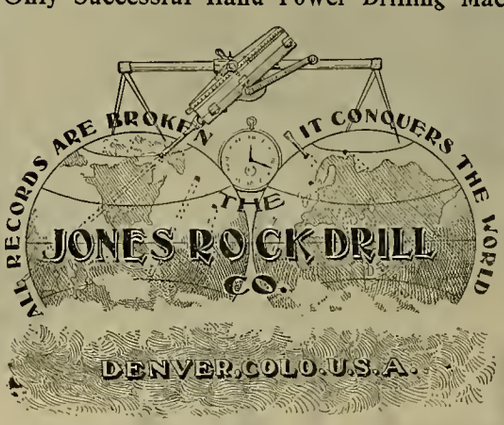

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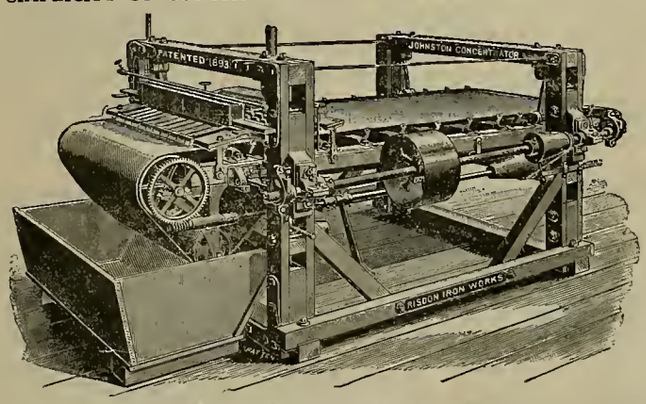

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THE HUDSON GOLD MINING CO., WARD, COLORADO, June 8, 1894.

RISDON IRON WORKS, San Francisco—GENTLEMEN:—After a thorough test of the Johnston Concentrator, I am so well satisfied that I wired you to ship me two more as speedily as possible. I find the machine well constructed, easily kept in order, requiring but little attention, and doing entirely satisfactory work on our ore. After my experience with other tables, I am congratulating myself on my possession of the Johnston. Yours faithfully,

B. LANGRIDGE, Ph. D., Mining Engineer.

(COPY.) SAN FRANCISCO, CAL., June 1, 1894.

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[Signed.] By LEON SLOSS.

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 5. SAN FRANCISCO, SATURDAY, AUGUST 4, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

A Colorado Gold Mine.

When Colorado's Senators declared that desolation would sweep the Centennial State if the Sherman bill were repealed, while fully justified in strenuously opposing such adverse legislation, it is evident that the results were exaggerated, for if the usually accurate statements of our Colorado exchanges are to be credited, that State is entering upon an unparalleled prosperity by the development of the gold properties of the commonwealth. In three counties alone, it is asserted $12,000,000 will be the yield of '94, and the mining papers claim that the gold yield of the State for '95 will crowd that of California pretty close, in point of magnitude. While this is not at all likely, yet in the matter of gold yield, the only competition is one of friendly comparison: the ordinary element of business competition cannot enter into the question, for, unlike other forms of enterprise, gold is always sought by the buyer; there is no overproduction in the world's marts; the producer has to find no market; his customers find him; no matter how much he has he can readily dispose of it, and the more he has the better pleased everybody is. As a matter of interest to local readers, the method and manner of a Colorado gold mine are here given extended illustrated mention, we being indebted to that excellent journal, *The Colliery Engineer*, of Scranton, Pa., for the text and the accompanying cuts.

The mine selected for showing our sister State's gold resources, how men mine for gold elsewhere, and much pertaining to a gold mine as developed in Colorado is the Standley Consolidated mine, at Idaho Springs, Clear Creek county. The original article is by Prof. Arthur Lakes, of Golden, Col.

The mine is located on both banks of Clear creek, about a mile above the mining town of Idaho Springs about 40 miles from Denver by the Union Pacific railway, which runs up the canyon and through the property on the north side of the creek. Its altitude is about 7600 feet.

The geological formation is Archæan gneiss and schist, traversed by many large masses of a coarse crystalline granite, forming large irregular segregative veins of pegmatite, coarse sparry crystalline, granite of feldspar and quartz, with very little mica. These veins are irregular in shape and character. Sometimes they are only a few inches wide and long; at others 50 feet wide, and cleaving the mountain sides from top to bottom, easily distinguished from the country rock by their light pink color, and from their hardness standing out in relief above the surrounding rock like great red dykes. The course of the main system of such veins is northeast by southwest, another less powerful set cutting them diagonally.

The original owners thought that their claims covered the whole of the vein on both sides of the creek from mountain top to mountain top. But the present owner discovered by examining the maps, that a large part of the vein near the top of the mountain on the south side, owing to a mistake in observing the direction of dip in the vein, was not included in their location, so he located on the Aspen above them and opened upon the top of the mountain the Standley mining shaft. This is a double lesson (in Colorado): first, to be careful in locating claims; second, that good prospects and extensions in quite an old, long settled camp may yet be found by those who look for them.

After working the Standley for some time, the owner, by surveys and measurements, began to suspect that some of the workings of the Whale mine, adjacent, were trespassing on the side lines of his property. He opened a shaft on the vein at the extreme limit of his side line, down the hill, and broke into the middle of the Whale's tunnel. A compromise resulted in the present owner buying out the old mines and uniting the Whale, Hnkill and Standley in one property.

The first development of the vein was not promising. The surface of the lode showed little value, and not till many thousands had been expended did it be-

(*Continued on page 68.*)

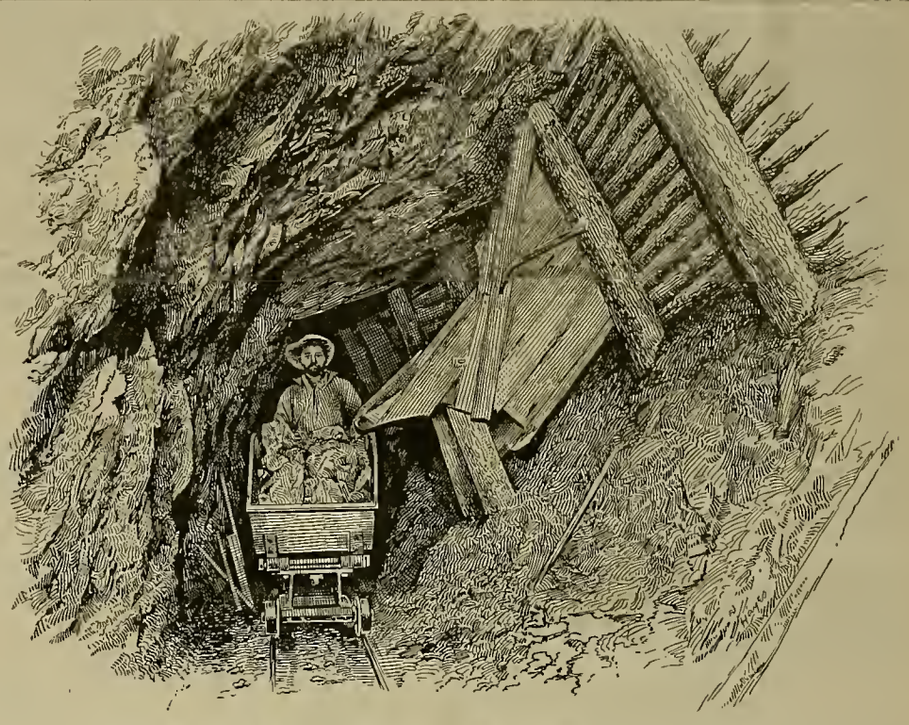

FIG. 9.—TRAMMING FROM AN ORE CHUTE. (*See page 69.*)

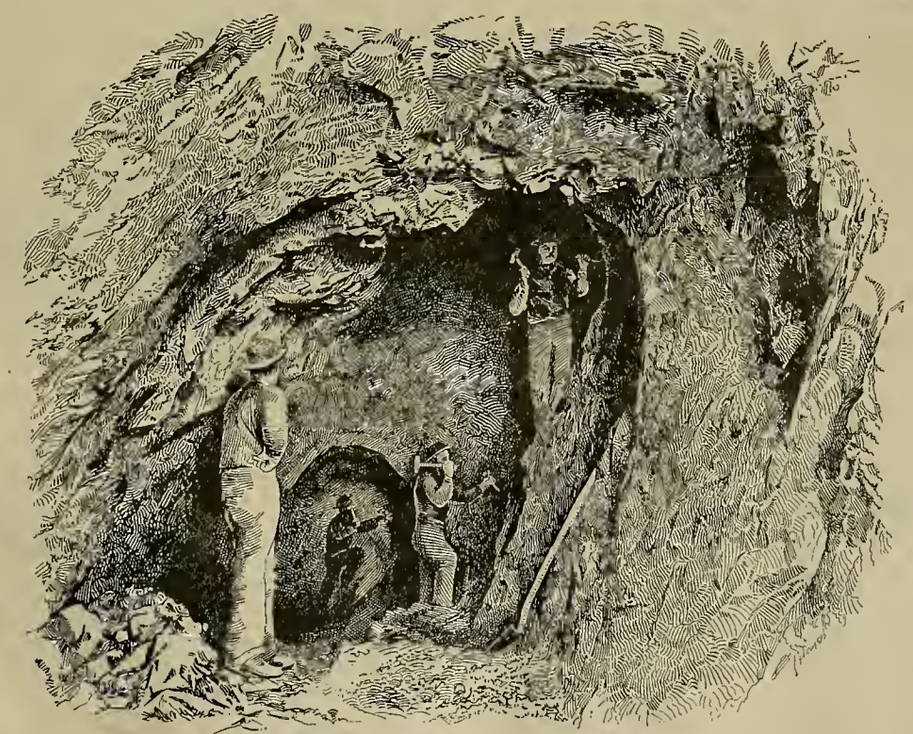

FIG. 7.—UNDERGROUND VIEW OF A STOPE. (*See page 69.*)

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Our latest forms go to press on Thursday evening.

Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, August 4, 1894.

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THE stock shares in the South Africau gold mines are passing from British to Freuch aud German holders. The Transvaal companies issne their shares "to bearer."

WHEN the capacity of the plant at the Mereur mine, Utah, is increased to 250 tons per day, which work is now in progress, it will be the largest works using the cyanide process in this country.

JUDGING from some of our exchanges therc seems to be an impression iu Montana that the suspension of required assessment work is for threc years. The bill as passed appears elsewhere and is explicit.

TEN DOLLARS is the present price of a ticket from New York to Liverpool. Thousands are flocking back to Europe from this country, many of whom came without welcome and leave without regret.

SINCE the first of January 33 new gold mining companies have been organized under the laws of this State. Is there any other industry in this or auy other Statc that exhibits morc present activity?

IN the vicinity of Los Augeles sixty-nine oil wells are producing 360 barrels per day, selling at $1.40 per barrel, crudc state, for fuel for cablc and electric railway. Twenty-one more wells arc about to be suuk.

CAMPBELL BERRY, the new assistant U. S. Treasurer, has takeu charge of the Sub-Treasury in this city. There was in the vaults on the 1st, $37,071,804.78; of this 39,600 pouuds are iu gold aud 1,392,000 pounds silver.

BY the first of next month Pekin, Cbina, will have a direct wire from St. Petersburg, Russia, aud be telegraphically joined to the rest of the world. About 100 miles between Osh and Kashgar, Turkestan, now building, is thc sole gap between the telegraphic girdle round the globe.

IT IS REPORTED that on Friday last a cloudburst occurred on the headwaters of Light creek, causing a very large flow of water. The waters of Indian creek, as a consequence, were very heavily charged with debris.—*Plumas National-Bulletin.*

The Anti-Debris Association should at ouce obtain a temporary iujunctiou against eloudbursts. It might attract renewed attention for thc association to institute a quarrel with thc Almighty.

'TIS over thirty-two years siuce naval warfare was revolutionized by the fight betweeu tbc Monitor and thc Merrimac. The most importaut uaval conflict since then in point of probable results with modern vessels was fought last Monday off the Corean coast between the Chinese and Japanesc fleets. It was not thought such practical test of floating ordnance would be made by Asiatics, but it happened so. The destruction is tremeudous, tbe Chinese losing four large vessels, one of 7400 tons, armed with Krupp guns.

THE prominence that electrical affairs are assuming is illustrated by the appearance of wbat may be styled "electricity lawyers." This is the age of specialties. We have corporation lawyers, real estate lawyers, crimiual practice lawyers, and now comes a class who devote themselves exclusively to "electrical cases."

BRITISH COLUMBIA is making a stroug effort in tbe Canadian parliament to get the duty off mining machinery, or at least to have a more liberal administration of the present law. It is believed that the effort if successful will be for the best interests of that proviuce. Mining machinery is needed to develop British Columbia's mines, aud to shut out American machiuery is to shut off the most efficient form of development. American machinery for successfully treating gold, silver and lead ore, is thc only kind of any use in British Columbia. This is the strongest argument that British Columbia's representatives can make, being practically unanswerable.

OLD Pacific coasters will remember the project in 1865 and 1867 to build a telegraph line tbrough British Columbia and Alaska, crossing to Siberia. The line was built almost to the Alaska boundary. Recollections of it are revived by the presenl propositiou of buildiug a line of railway up to and aeross Bering strait. Those who, visionary or otherwise, favor the enterprise say that at tbe point to be crossed between Asia and America, the strait is but thirty-six miles wide, broken nearly midway by the Dromeda islands, and that a depth of not more than forty feet, with a solid rock bottom can be relied on; it is further claimed that the Arctic current, passing northward, forever keeps thc channel free from ice. Still, it will probably be a long timc till some future Debs orders a strike on thc Alaska & Siberia Transcoutinental railway.

HENRY CLEWS, who weekly issues a letter that from his point of view is full of meat, suggests to Secretary Carlisle that duties be made payable in gold. He says that would stop the drain on the treasury gold reserve. Whatever else it would or wouldn't do, such a move would send gold above par. It is not altogetber improbable that gold will soon be quoted at a premium anyhow. But since '78 silver dollars are payable for all duties, public or private. Should Congress take away that functiou, gold would bound up to 1.20 or 1.25 before thirty days. That provision is the last thing in the way of such consummation so devoutly wished by Mr. Clews et. al. The matter is not wholly in Secretary Carlisle's hands, and even the present Congress would hesitate to adopt so drastic a method. The easiest and best present way to check the gold draiu was pointed out in this column three weeks ago—to hold the legal tenders as tbey are presented and redeemed, coustituting them a part of the reserve till they are called for iu exchange for gold, theu to be reissued.

Mine Timbering.

Mr. J. J. Crawford, the State Mineralogist, has issued from the State Mining Bureau Bulletin No. 2, "Methods of Mine Timbering," compiled by W. H. Storms, which is of great practical value. Tbe systems of timbering used and adaptable in quartz and drift mining on this coast are giveu thorough consideration, tbe treatise being the result of visits to mines where tbe details were observed and berein given clearly and practically. The pamphlet is embellished by uumerous engravings, adding materially to its value, and will be sent to any one wishing it who will send his address to the State Mining Bureau. Tbe issuance of sucb publicatious as tbe oue here briefly noticed illustrates one of the many direct benefits of tbe Mining Bureau. It is notbing more than the statement of a fact to say that in no department of auy California public institution is there more direct and manifest benefit derived by the State for the money expended tban in the operations of the State Mining Bureau.

Care of Mine Cables.

The care giveu the mine cable is an important feature in mine management. Upon the coudition of a cable depends largely the safety of the men employed. This is thoroughly understood by nearly every mining superintendent and foremau, and every mine that aims to keep up to the requisite standard of safety in this importaut regard has a mau whose daily duty it is to thoroughly look the cable over, keep it lubricated, etc., and report on its condition. Wben an accideut does happen, which fortunately is very rarely, its seriousness is sufficieut illustration of the importance of keeping the cable in the highest state of efficieucy. In this regard it is the wisest economy to replace a eable the moment it shows signs of being in the least unsafe. Proper care lengtheus the life of a mine cable. The effects of heat and dampness can be largely counteracted by lubrication and the application of tar. A cable will wear out faster in a hot, damp mine than iu a cool, dry one.

There are a good many systems of cleaning and preserving mine cables, aud at every large mine the man who has charge of the cablc geuerally prefers his system to any other.

It is believed that while tar is a good thing to preserve the cable from the effects of dampness, yet it is not always worth as high a place iu the preferenee of some as it seems to hold. Tar, of itself, will wear out and destroy a cable, by reason of its stickiness, displacing thc fine strands by adhesion and disruption, while the cable is being wound or unwound. A good anti-friction and preserving compouud for mine cables is composed as follows: Soft tallow, seven parts; plumbago, three parts; mix thoroughly; make a long, hollow box or trough; gouge out a 4x6-piece of scantling about two feet long; saw it down lengthwise, and hollow out the box or trough euough to hold several pounds of the compound, making a hole lengthwise of the trough for thc cable to run through. Affix to rope and clamp securely; have thc box or trough fixed so that it cannot play and let the cable pass through it while going up or down, so that it will get a thorough coating. This will preserve a round cable very well, and can be used at least once a week. For a flat steel cable, raw linseed oil can be used instead of the tallow in about the proportion of six parts of oil to threc of plumbago to get the right consisteney. When tar is used, linsecd oil should be added to keep the tar from adhering, both ingredients to be mixed while warm.

The Assessment Suspension.

Senator Perkins and Congressman Caminetti send us the official text of the bill suspending mining assessments. It is as follows:

An Act to amend section numbered twenty-three hundred and twenty-four of the Revised Statutes of the United States relating to mining claims.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of section numbered twenty-three hundred and twenty-four of the Revised Statutes of the United States, which require that on each claim located after the tenth day of May, eighteen hundred and seventy-two, and until patent has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year, be suspended for the year eighteen hundred and ninety-four, so that no mining claim which has been regularly located and recorded as required by the local laws and mining regulations shall be subject to forfeiture for non-performance of the annual assessment for the year eighteen hundred and ninety-four: *Provided*, That the claimant or claimants of any mining location, in order to secure the benefits of this Act, shall cause to be recorded in the office where the location notice or certificate is filed on or before December thirty-first, eighteen hundred and ninety-four, a notice that he or they in good faith intend to hold and work said claim: *Provided, however*, That the provisions of this act shall not apply to the State of South Dakota.

SEC. 2. That this Act shall take effect from and after its passage.

Approved July 18, 1894.

It will be observed that the bill is similar to the one passed last November for '93. It originally exempted the second Congressional district of Colorado. It will this year operate more generally in the liues iutended. being passed four months earlier than last year.

GREAT OBJECTION is made by Utah's mining papers against the appointment of J. B. Rawlings as Territorial mine inspector. The claim is made that he is totally destitute of mining knowledge.

CONGRESS has been in session a year. The record of what it bas done is very brief.

Concentrates.

MINERS' wages at Kennedy district are $3 per day.

A NEW 60-stamp mill is being put in by the Telluride Consolidated M. & M. Co.

GRASS VALLEY has accepted plans for a system of sewers to cost $40,000. It needs 'em.

THIRTY men have been temporarily laid off at the Crown Point mine, Virginia, Nev.

A $35,000-MILLING OUTFIT is being put in at Sherman, Colo., for the West End G. M. Co.

THE red oxide ore at the new camp of Kennedy, Nev., is pronounced almost entirely free milling.

TWO Utah men have bought the Blue Jay and Keystone mines, Albany Co., Wyoming, for $15,000.

JAMES HACKETT is working his mine at Rough and Ready, Nevada county, by the hydraulic process.

THE Rex Gold Mining Company has incorporated with $400,000 capital stock; to operate in Lake county, Col.

IT is alleged in Salt Lake that the famous Dead Man's mine in Uintah county, Utah, is simply a salted "fake."

THE Poorman (Idaho) is again shipping its daily quota of concentrates—fifty tons. About 175 men are employed.

THE Empire mine is reported sold to three San Francisco men, who will put up a stamp mill and chlorination works.

JAS. MONAGHAN'S Cariboo claim in Camp McKinney on upper Kettle river in British Columbia recently yielded 31 pounds of gold.

MINERS are said to be deserting Globe, Arizona, in large numbers. It is thought the shut-down there will be of long duration.

A COMPANY has been formed in Europe with a capital of $250,000 to establish hydraulic works on Williams creek in Cariboo.

THE Government is building a road from the Columbia river to Cariboo creek, the scene of the latest placer excitement in British Columbia.

FIFTY more miners have gone to Rush Creek, Plumas Co., to work, and the bed of the channel for three miles is now staked off for claims.

THE Hope, Montana, Mining Company's recent dividend of twenty-five cents per share makes a total of $558,250 in dividends paid by that Company.

HUGH L. COOPER, on the Pen d'Oreille river, B. C., has secured a lease from the Government of a thousand acres of placer claims which prospect well.

THE American National Gold Mining Company is a new Colorado incorporation; capital $100,000; will operate in Gilpin, Clear Creek and El Paso counties.

THE Little Chief Mining Co., at Phœnix, Arizona, has bonded the Jones properties on Cave creek, bought all the Mormon Girl plant, and will push things.

AT the assay office at Helena, Montana, the purchases of gold bullion for the first half of '94 aggregated $900,711; for the first half of '93 the aggregate was $518,980.

THE statement in the Cripple Creek *Journal* which says that a half-interest in the Hidden Treasure lode has been sold is denied. The World Company still owns the entire claim.

IN the Evening Star mine at Grass Valley, which gave such good returns years ago, the new shaft is reported to have cut the main ledge, and there is every prospect of rich ore yield.

OWING to the death of Stephen Sherwood the celebrated Sherwood mine at New River, Trinity county, is shut down, awaiting the appointment by the probate court of an executor of his will.

THE July purchases of gold at the Denver assay office, or branch mint, aggregated $800,000: for July, '93, the aggregate was $216,000 illustrating the increased activity in the gold mines of Colorado.

THE Tuolumne *Independent* says Thomas Ewing now has a controlling interest in the Black Oak mine at Soulsbyville, and that he will build chlorination works and increase the mill's capacity.

ALBUQUERQUE, N. M., thinks a new smelter is a necessity there. One mine-owner with 1000 tons of ore in sight and 100 tons on the dump offers a half interest in his mine for the establishment of one.

DR. CYRUS TEED now announces that he "can make gold" for $6 a ton. Of course, like all such people, he thinks that whoever disagrees with him is "silly," and that when he dies wisdom dies with him.

THE seventy-five employes of the Providence Mining Co., at Nevada City, Cal., donated one day's work last month to Harry Shearer, an unfortunate fellow miner who was badly injured by a cave recently.

THE White Pine *News* says seven tons of gold rock from the Serpent, located in Osceola district, were worked at the Chainman mill last week and produced a bar valued at $285, an average of $40 to the ton.

THE African Gold Recovery Company announce that 51,500 ounces of gold have been recovered at the Randt, and 6500 ounces in other districts, total 58,000 ounces during June, by means of the cyanide process.

WITHIN one year, says *Ores and Metals*, the cost of erecting a stamp mill in Colorado has been reduced 30 per cent. Formerly the cost was $1000 a stamp, while now it is $700 a stamp. The cheapness of iron permits this.

THE Bassick Gold Mining & Milling Company has been incorporated at Salt Lake, Utah, with a capital stock of $5,000,000. The company owns the Bassick mine in the Hardscrabble mining district, Custer county, Colo.

THE Bi-Metallic Company in Montana has finished a lixiviation plant for working tailings from amalgamation. It has 12 ore vats of 22 feet diameter and 10 feet depth, which will hold 150 tons each. Its capacity is 300 tons per day.

THE Bland Mining and Milling Company has incorporated at Helena, Montana. The incorporators are John Lynch, Geo. B. Wilds, James W. Hamilton, Wm. H. Smead, Joseph Murphy, Wm. A. Simons and John Doudell. Capital stock, $250,000.

THE Mountain View Gold Mining Company has incorporated in this city; directors—James H. Hall, J. M. Kaufman, Thomas A. Dehay, Henry Phillips, William H. Chapman; capital stock, $1,000,000, of which $5,000 have been subscribed.

THE Oaks Consolidated Mining Company has incorporated in this city: directors—James L. Rathbone, A. H. Rapp, Charles E. Shafer, Thomas A. Fisher and Thomas Ewing; capital stock, $1,000,000, of which $750,000 has been subscribed.

THE yield from the gold ore presented to the committee in charge of the Fair mining exhibit when run through the mill was $1258, exclusive of four tons of sulphurets worth $100 a ton. About one-half of the total yield was from Nevada county ore.

THE Boyce gold-saving machine, for saving the fine gold of Snake river, is in operation at Blackfoot, Idaho. It is said to save 95 per cent of the gold. In operating a machine of thirty yards' capacity per every ten hours there were cleaned up $119.

THE Angels Milling Company has incorporated. Principal place of business, Angels Camp. Capital stock, $3,000, with George Stickle, Jr., Robert Rasmussen, Eugene B. Cushing, Robert Gardner and John H. Carley of Angels Camp as directors.

THE Amador *Dispatch* says: A nice little nugget of gold, worth about $117, was picked up one day last week in the Eckhart claim, at Volcano, by T. Eckhart and a man working with him. It was a solid piece of metal without any mixture of quartz in it.

THE Nevada City *Herald* says that the Anti-Debris Association became anxious because "the South Yuba was considerably muddled for a few days, but from what source is not known." It is enough to muddle even a river to have the association watching it.

D. R. CAMERON, sheriff of Shoshone county, Idaho, is reported as saying that matters there are in a very precarious condition, and the continued presence of troops is absolutely necessary. Without them business would cease and life and property would not be safe.

IT is reported that the Kansas City Smelting and Refining Co. and the Mexican Central will build a branch road 100 miles from Jimenez, past Paral to the Buencevi mines in Mexico. The necessary concession has been granted by the Government and surveys made.

THE Alaska-Mexican Gold Mining Co. reports the cleanup for the month as follows: Period since last return, 31 days; bullion shipped, $15,951; ore milled, 6250 tons; sulphurets treated, 100 tons; of bullion there came from sulphurets, $3181. The working expenses for the month were $12,472.

IT is thought there is a prospect of opening up the Meadow Lake mines this season. Denver companies come with processes for working the rebellious ores. No one has ever doubted the essential richness of the mines there, but so far no process has been found to give wholly satisfactory results.

THE Bodie *Miner* learns that C. E. Loose owns two-fifths of the stock of the Provo Con. Milling and Mining Co. of Provo, Utah, and is the superintendent and manager of the concern. It is a silver proposition, and though there are only twelve men at work $40,000 has been paid in dividends the past four months.

THE Pelican-Dives mine near Silver Plume, Col., is reported to have more ore in sight now than it had at the time of the great trouble in the 70's before the consolidation of the two properties, and that there is ore running from the shaft that will average $200 per ton. About 200 miners are now employed.

THE Sand Creek Mining and Improvement Company has incorporated at Butte, Montana. T. A. Grigg, D. R. Barlow and C. H. Sherwood are the incorporators. To conduct a general mining business, reduction and smelting of ores, lease, sell and deal in mining property. Capital stock $1,000,000. Principal office in Butte.

A. W. CALLEN has sold the Prolific and Manzanita gold mines, at Placeritas, Arizona, to the Isabella Mining Company of Chicago for $100,000. The new owners will put up a mill having a capacity of thirty tons a day, and build a good wagon road from Placeritas to Morgan station, on the line of the S. F. P. & P.

E. S. STOYBER and F. Meier, of Silverton, Col., proprietors of the Silver Lake mines in Colorado, are arranging for the building of electric machinery with which to operate their mines. Their mines are located on the mountain side, and they intend to generate electricity by utilizing the waterfalls and putting in dynamos.

IN the vicinity of Alleghany, Sierra county, considerable activity in quartz mining is reported. Three ten-stamp mills are building—one for the Rising Sun Mining Company, another for B. B. Lewis and John Fessler, and one for Henry Johnston, which is expected to be running next week. There is a good country there worth developing.

THE United States Economical Reduction Company is building a reduction works at Florence, Col., for the treatment of refractory gold ore, that is expected to be the largest in the State. It costs $200,000 and will be unique in combining plain amalgamation, carbon reduction amalgamation, chlorination and a modification of the cyanide process.

AN enthusiastic correspondent of the Denver *Record*, writing from Salmon City, Idaho, figures out in a 1½-column article that fourteen miles from that place there are 10,000,000 yards of "fine grained, soft, silty rock" that samples $2 a yard. Twenty million dollars ought to be enough of an inducement for some one to get in with a fine gold process.

THE Last Chance Mining and Milling Company, with headquarters at Almo, Cassia county, Ida., has filed in the office of Secretary of State Curtis its articles of incorporation. Of the capital stock of $200,000, $175,000 is paid up. The incorporators are Thomas P. Potts of Woodland, Utah; Edwin Dowden, of Salt Lake; James M. Durfee, John Potts and T. H. Potts of Almo.

AN important decision was recently rendered by Judge Hawkins in Northern Arizona in the case of the United Verde Copper Company vs. County Treasurer. The suit was brought to restrain the tax collector from selling ore assessed at $30,000 for delinquent taxes. The judge held that ore on the dump was subject to assessment and taxation. The case will probably be appealed.

THE new twenty-stamp mill of the Sunrise Mining and Milling Company is in operation at Phillipsburg, Montana, with ten stamps. The mill plant has cost the company about $20,000, which seems a high figure for a twenty-stamp plant; but, says the *Mail*, considering that the engine and other machinery was purchased in view of furnishing power for more extensive operations, the cost is really considerably less than it would have been in times of ordinary prosperity.

THE Central Copper Mine Co. of Kewanee, Mich., shut down last Tuesday, thus closing a forty-year term of continuous operation of that mine. The shutdown is due to the exhaustion of the vein and the failure to find other deposits on the company's property. Four hundred men dependent on the mine are out of employment. This ends the copper-mining industry in that section.

LAST Tuesday, at Colorado Springs, Idaho, the Portland Gold Mining Company became sole owner of the Annalee and Doubtful lodes, formerly owned by the Amazon Company, and the Bobtail No. 3, an undivided seven-sixteenths interest in the Bobtail, the White House, National Ball and Captain lodes, formerly owned by the Battle Mountain Company; consideration, $500,000 cash.

THE Park, Utah, *Record* says the Deer creek gold excitement has faded into nothingness. There is no yellow metal to be found in the canyon. Old prospectors simply looked the country over and then left without wasting any strength in digging, being convinced from the formation that it would be only time wasted. The many holes sunk by novices without results show how true was their judgment.

THE Stevenson Gold & Platinum Hydraulic Mining Co., Ltd. has been incorporated under the laws of British Columbia, with an authorized capital of $1,000,000, to develop a placer mining claim at Granite Creek, containing 640 acres. Tests on the upper benches, which average from 30 to 150 feet in depth, have given returns as high as $1.50 per cubic yard, but the average is expected to run 25 cents.

THE Toledo mine and concentrator on Mill creek, west of Sheridan, Montana, were sold last week at sheriff's sale for $6000 to Levi Cartier, who held a mortgage of $6500 on the property. The Toledo, in the days when silver and lead were worth a fair price, was one of the best properties in that district, and the mine is by no means exhausted. The concentrator was erected four years ago at a cost of $12,000.

GEORGE J. PERKINS of Truckee is the inventor of a water tube boiler for locomotives. The *Republican* says he has been in the East for about a year testing his invention, and has succeeded in organizing a company at La Crosse, Wisconsin, with a capital of $800,000, to manufacture and introduce the boiler. It is claimed that its use will save 25 per cent in fuel, and with it no fire is emitted through the smokestack.

THE Tehama Mining & Milling Company has incorporated at Ogden, Utah, with a $750,000 capital stock. The mining properties are located in the Bountiful mining district, Davis county, Utah. The mines are said to produce free milling gold ore, not of extraordinary richness, but the ledge is of vast extent. The mill site and water power are perfect, and the situation of the mines is such that the ore can be mined at a very low figure.

RECENTLY the entire 120 stamps of the San Miguel Consolidated Bear Creek mill and the forty-stamp Gold King mill, at Telluride, Col., were dropping simultaneously making a power test, which proved satisfactory. The distance from the mouth of Bear creek, where the connection was made with the electric-power line of the San Miguel Consolidated to the Belmont mill, is four miles. The distance from the mill to the generating station at Ames is nearly 14 miles.

MEN employed at the Derbec drift gravel mine near North Bloomfield, Nevada county, quit work last Tuesday night because the management attempted to reduce their wages from $2.50 to $2 a day. The mules that have been hauling cars underground were brought to the surface and the machinery stopped. Wages in the county for gravel miners have long been $2.50 a day, and for quartz miners $3, and although repeated efforts have been made by some of the operators to reduce, they have in every instance been unsuccessful, despite the fact that the miners have no union.

AT El Dorado canyon, Lincoln Co., Nev., the Southwestern Company has suspended operations for a time, until arrangements can be made to secure supplies at a lower figure than has ruled for several years past. This is necessary from the fact that the ore deposits, though good, will not bear the unusual expense incident to mining in that out-of-the-way section. River charges have always been high, relatively, and freighting overland from Kingman, Ariz., renders it necessary to ferry everything over the river. Recently a road has been laid out from Vanderhilt to El Dorado, a distance of forty-nine miles, which, with some repairs, will be practical, and it may be that when resuming operations this route will be used and some station on the Nevada Southern made a shipping point, say Manvel or Vanderhilt.

Clipped and Condensed.

CHOLERA is spreading throughout France and Russia.

DELTA, Cal., was almost entirely destroyed by fire last Tuesday.

A $50,000 CASK of gold from New York was stolen while in transit from Havre to Paris.

THE House and Senate Conference Committee on the tariff expect an agreement on that measure this week.

THE result of the recent great strike is reduced work and wages in all branches of labor in and around Chicago.

BY a new ruling the Government Fish Commission and the Geological Survey are attached to the Agricultural Department.

THE Labor Commission appointed by the President to investigate the causes of the recent strike will hold its first meeting at the Postoffice building, Chicago, on the 15th.

IN two naval battles off the Corean coast the Japanese fleet sunk two of China's best modern ironclads, entailing great loss of life by drowning. China will confine further operations to land.

POPULIST SENATOR ALLEN of Nebraska has introduced in the U. S. Senate a bill to provide for the issue of $50,000 in treasury notes to be distributed among the States for the relief of the worthy poor.

EUGENE BRADEN has been appointed Assayer in Charge of the U. S. Assay Office at Helena to succeed W. F. Wheeler.

A Colorado Gold Mine.

(*Continued from page 65.*)

come productive. As depth increased the ore became more solid. In the Whale and Hukill little or no lead ore was found. In the Standley a lead zone was found, which in depth became the usual iron and copper pyrites. The silver values were greatest in the upper workings; with greater depth the silver diminished and the gold increased. Ore from the upper workings averaged 70 to 100 ounces silver per ton, and $1.50 to $1.75 gold in the lower workings.

The ores at present are dry quartz ores, mainly composed of iron and copper pyrites, with purple copper or hornite, and bright irridescent-hued peacock copper. There is not much free gold in the mine, nor does it appear there ever was, even at the surface, where it is generally found most abundant. The gold values increase with depth, especially at the bottom of the shafts; whilst laterally lead ore is found near the surface. Over two-thirds of the developed ground has been productive. The vein has been opened for over 3000 feet continuously, and prospected on the surface for 3000 feet further.

There are 14 lode claims, six placers covering 7000 feet of the vein and two miles of the creek. There are five principal ore chutes, or zones of principal mineral deposit on the vein, with average intervals between them of 200 or 250 feet. These ore bodies are more likely to be found under gulches and depressions on the surface than under mountain crests. The ore averages in silver 30 to 40 ounces per ton, and gold 2½ to 4½ ounces. Some of this ore, being poor and low grade and mixed with much rock, is a concentrating ore, and some of it goes direct to the smelter. The average assay value of the present ore is:

FIRST CLASS.	
Silver in copper ore	35 ounces
Gold	2½ ounces
Silica	26 per cent
Iron	24 per cent
Copper	5 per cent
SILVER IN LEAD ORE WITH NO ZINC.	
Silver	25 ounces
Gold	1¼ ounces
Lead	30 per cent
Silica	20 per cent
Iron	15 per cent
CONCENTRATES.	
Silver	20 ounces
Gold	2 ounces
Iron	23 per cent
Silica	16 per cent

The vein would popularly be classed as a so-called "true fissure vein," but if by this is meant that there was once a wide open fissure five to ten feet wide gradually filled with ore and quartz, there is no such thing there. Doubtless there was once a crack in the rock, similar to the cleavage plains or joints we have described in the canyon. This fissure or line of weakness, along part of its course, became a zone of alteration or mineralization of the country rock adjacent to it. The so-called vein exposed in the roof of the tunnels or on the face of the stopes, is in some places simply a line of rusty, rather decomposed rock, but a few inches wide close to the footwall. The remainder of the vein or gangue above the footwall is generally the ordinary gneiss or schist somewhat rusty, with little seams of quartz or feldspar, and little streaks of ore, an impregnation rather than a well defined vein. This mineral impregnation grades gradually into the country rock without any well defined limiting hanging wall. The vein in this part may be described as a zone of mineral impregnation near a line of fracture.

Farther on this zone is occupied by a singular combination, consisting of a belt of breccia five feet wide, formed of fragments of porphyry and granite. (See Fig. 1.) Though most of the fragments are angular, both porphyry and granite often assume a perfectly rounded pebble-like form. Running in and out between these blocks, and often acting as a cement to them, is the ore, mingled with quartzose matter, or by itself alone. Sometimes this breccia lies in two well defined zones on either side of a central mass of quartz and feldspar, speckled and veined with ore. In most cases the richest smelting ore lies by itself in a narrow zone between the breccia and either the hanging or footwall of gneiss.

FIG. 1.—VEIN PHENOMENA.

H. W.—Hanging Wall. F. W.—Foot Wall. R. O.—Rich Ore. C. O.—Concentrating Ore. Q. F.—Quartz, Feldspar, Etc.

This part of the vein doubtless originated in a fissure, which was enlarged by the eruption of the volcanic breccia, which carried up in its embrace fragments of the granite torn from the sides of the fissure, and pieces, too, of congealed porphyry; and, either by alteration or partial melting, reduced them to rounded pebbles. This may have been assisted by steam, but it seems hardly possible that underground waters circulating in the fissure could have given the fragments their rounded form.

Such a breccia zone, impregnated with ore matter, may seem anomalous, and different from the orthodox idea of a fissure vein. It is not, however, uncommon in these mountains for a porphyry dike without the presence of quartz to be impregnated by mineral and to constitute the vein to all intents and purposes, as, for example, the vein of the Mattie mine in the same neighborhood, which is only an impregnated porphyry dike.

It is to be observed that a dike of porphyry runs close by, back of and parallel to what should be the hanging wall, very nearly making the vein a contact vein, between porphyry and gneiss. (See Figs. 2 and 3.)

In one case, toward the end of the third level north, this dike has entered and absorbed the usual zone of the breccia vein, and retained only the narrow zone of the rich smelting ore between it and the gneiss, making this part of the vein a true contact.

This barren porphyry again in places cuts through both breccia and vein, and at others intrudes long, narrow tongues into the gangue. The vein never passes through this porphyry, but is thrown by it. Hence it appears that though the porphyry seems of the same nature as that in the breccia, yet it must have been erupted after the breccia, and after the breccia was mineralized.

This porphyry, of a light color, seems to have been reduced to a highly plastic or even molten condition, for it insinuates itself into every crack and crevice in the vein was found on reaching it to be somewhat scanty, and lying on the well defined footwall; the hanging wall was less definite. Both walls were of granitic rock. Contrary to the popular idea, two well defined walls, *i. e.*, footwall and hanging wall, are very rare in mines in this region. There is commonly but one wall, and that often but ill defined. The footwall in an inclined vein is that which slopes away from you, and upon which your feet would naturally lean toward, whilst the hanging wall is the opposite side of the tunnel where the rock naturally overhangs you or slopes towards you. A wall in a mine is generally recognized by a prevailing smooth

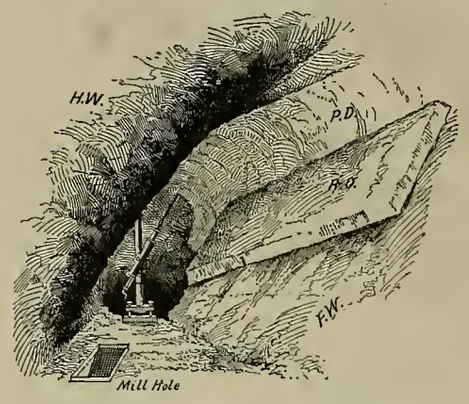
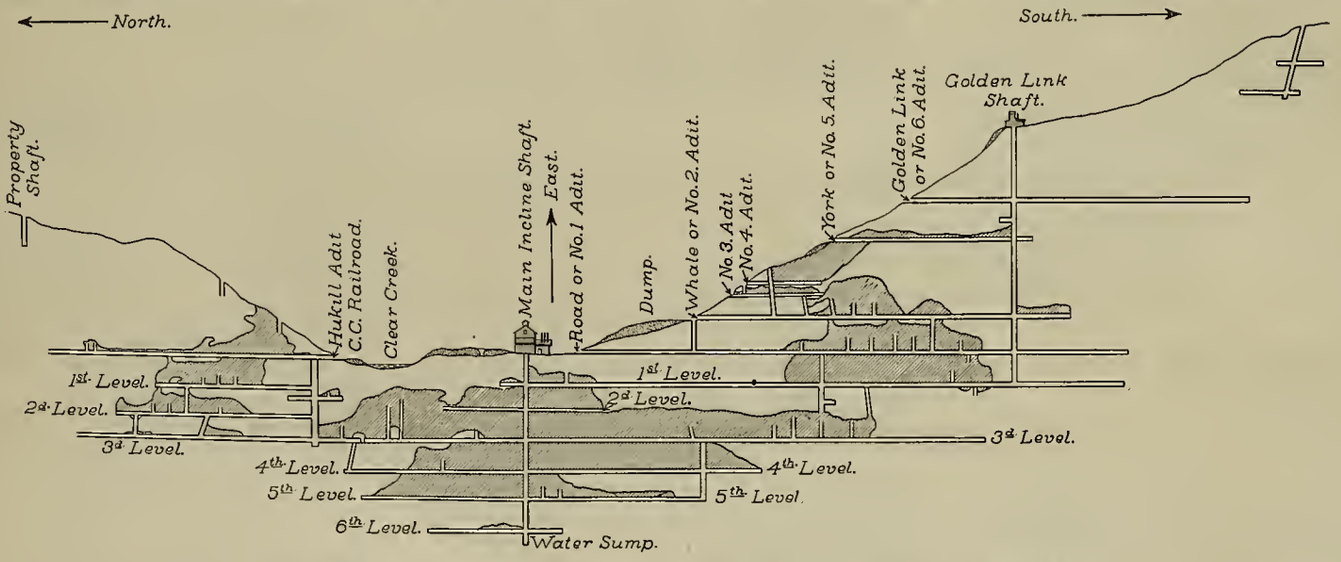


FIG. 2.—CONTACT VEIN IN STOPE OF 3d LEVEL.

They incline inward at a slight angle toward the cap. Back of these the walls were lined with lagging. On the floor was the tramway, the rails 18 inches apart, laid on ties as on a railroad.

This diagonal crosscut reached the vein at a distance of 200 feet, when the rock becoming firm and solid no more timbering was required. The ore of



COMPLETE LONGITUDINAL SECTION OF THE STANDLEY CONSOLIDATED MINE.

aud is constantly and most unexpectedly met with in the mine.

The course of the vein is northeast and southwest dipping to the west at an angle of 68 degrees from the horizontal.

Entering the mine by the level on the south bank of the river, known as "Level A" (see plan of workings), for some reason, though but a few feet from the outcropping vein, it was not driven in directly on it, but aimed to cut it by a long diagonal crosscut. This level was eight feet high by five feet wide. It was well timbered for the first few hundred feet, owing to nearness to the surface making the roof and walls of rock loose aud unsafe. The stulls or upright timbers as well as the cap or top of the arch were of sawn timbers, cut square, eight inches thick.

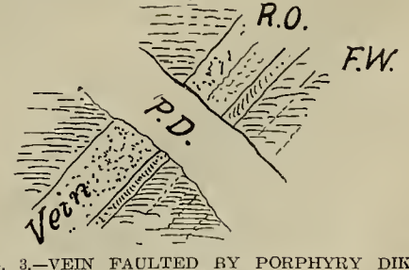


FIG. 3.—VEIN FAULTED BY PORPHYRY DIKE, 3d LEVEL.

surfaec on onc or both sides of the vein. The so-called vein, as we have deseribed, was here but a rusty linc in the granitic rocks. After 500 feet of this poor material, richer stuff was encountered, which induced them to stope upwards. The rich streak or chute continued to the breast or end of the level for some 1500 feet, where operations are still continuing.

In stoping, an upraise is made by a power or air drill in the roof of the tunnel to a height of perhaps 50 feet. See Fig. 4, where the air drill pillar is planted in the tunnel and the drill is in the roof. An opening upwards is thus made, the dirt from the ex-

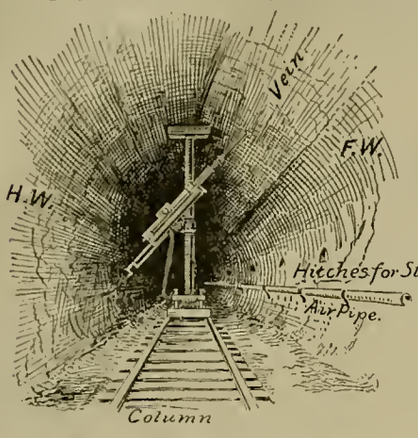


FIG. 4.—DRILL, PREPARING TO STOPE. COLUMN SET VERTICALLY.

cavation falling into the tunnel below. From this chute, stoping is eommenced; that is, exeavating along the vein on either side of this chute, beginning at the bottom. In doing this, the drills are directed in a slantiug direction downwards, so that water can be poured into the holes to assist drilling. In this stope the gangue matter of the vein is blasted down first, away from the richer streak of ore, which in this mine invariably lies elose onto either footwall or hanging wall, generally the footwall. Previously, however, so soon as stoping begins, thick stulls are laid aeross the upper part of the tunnel from wall to wall, each of them five feet apart from centers, and on these are laid lagging of poles 15 feet long, forming a floor on top of these stulls. (See Fig. 5.) The cross stulls in this case were the width of the vein, and two feet thick. The butt end of a stull is laid in hitch or square notch, eut in the face of the footwall, and the other end is jammed down on to the head in the hanging wall at a nearly right angle with both walls.

These stulls in this mine, with inclined walls, have to be very thick and strong to support the enormous pressure of the hanging wall, a pressure in this mine increased by the swelling of a body or dike of porphyry behind the hanging wall.

The stulls and lagging having been laid as a floor, the work of stoping upwards progresses. The dirt

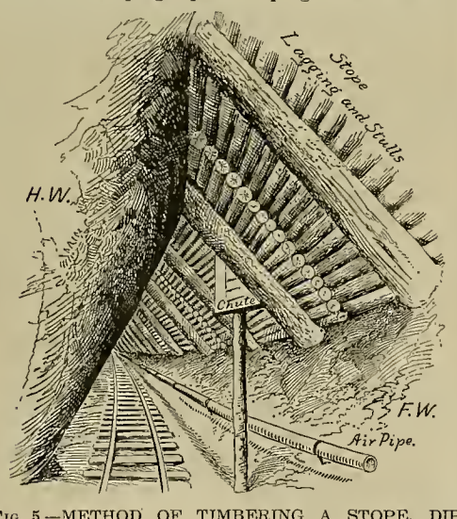


FIG. 5.—METHOD OF TIMBERING A STOPE. DIP OF HANGING WALL 68°.

falls on the lagging of the floor, but much of its pressure is distributed over the sloping surface of the footwall, instead of all on the floor of lagging and stulls. (See Fig. 6.)

On top of the dirt that falls from his work upon the lagging floor, the miner stands to contiuue his attack on the roof of the stope (See Fig. 7, on page 65, and Fig. 8) with the power drill, whose pillar may be, as in the illustratiou Fig. 8, placed across the stope horizontally or else vertically.

After the poorer rock of the gangue (*i. e.*, the vein part from wall to wall) has been blasted down, and scaled off from the streak of rich ore that in this case lies close to the footwall, the poor, barreu rock is broken up small to make a somewhat smooth floor to receive the precious ore as it is broken down. This, if soft, is either taken down with a piek or gad or else blasted down with a light charge of powder.

In Fig. 7 the men appear to be taking the ore off the footwall with hammer and chisel.

Meanwhile, to dispose of this ore and get it down safely into the tunnel below, a chute or mill hole has been kept open and carefully timbered with small eross sets of timber to the level of the floor of the stope (see Fig. 8), where it is as an open chimney down which to throw the ore into the tunnel below, where a car stands (see Fig. 9, on page 65,) ready to receive it and carry it out on the dump, to be wheeled to the mill or sorting room or to the incline shaft for hoisting. As the dirt on the floor of the stope rises, additional cross pieces are added to keep the mill hole or ore chute free and clear from stones. The mill hole is wider at the bottom, which is called a pocket, than at the top. This enlargement is doue to prevent stones clogging, hence the mill hole is in the form of au inverted funnel.

Down this ore chute the ore is dumped into the car in the tramway at the bottom of the tunnel.

Very rich ore is sometimes carefully broken down on a blanket spread on the floor of the stope.

The result of driviug the drill holes down in a slanting direction is finally to make one end of the stope higher than the other.

On reaching near the upper level, if the ore is not very valuable, a pillar is left, or else it is stoped clear up to the track and filled in. The vacant space is filled by stoping on one side and filling in, laying cross pieces from wall to wall to support the rails of the upper level whilst this is in process. Commonly this part is filled up during the night shift, so that by morning the cars can run ou the rails of the upper level.

Mill holes or ore chutes, as they are called, are generally placed at every 40 or 50 feet apart. Men may be working at one end of a stope, and others at

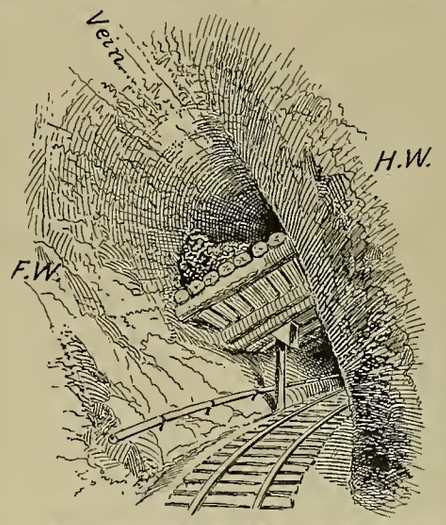


FIG. 6.—END VIEW OF A STOPE SHOWING HOW THE WEIGHT OF FALLEN ROCK IS DISTRIBUTED ON FOOT WALL AND LAGGING.

the farther end, the drilling holes converging toward the cutter. The cross-section of the vein is well seen on the roof and end faces of these stopes.

The gangue is generally a breccia, more or less impregnated with ore, which will pay to concentrate, but is not rich enough to smelt. The smelting rich ore keeps elose to one or the other of the walls and is sometimes a solid mass of pyrite or quartz and pyrite.

In blasting, dynamite is used. The power drills usually drill in a few hours half a dozen holes six or eight feet dcep, according to the amount of rock they desire to break down. A power drill will do in six hours what it would take a man by hand labor a week to do. When it is desired to break down a great quantity of rock, a number of holes are drilled at different distances and the charges ignited simultaneously by an electric battery.

The pillar mode of supporting the drill in these narrow veins is here preferred to the tripod system. The pillar can be placed in any position horizontally or vertically, and they have them of all lengths to suit different widths or heights of the tunnels.

The main air pipe supplying power to the drills passes along the side of the main levels, low down, but above the ground, and is four inches in diameter. Smaller inch pipes of iron are attached where side drifts branch off to supply the drills and to the end of these pipes about 50 feet or more of hose cased in wire is attached as a flexible attachment to the drills themselves. Two men atteud upon each drill.

Along the main tunuel, at a certain point, a cross-cut had been made into the footwall, which showed that the vein here had split up into three branches, each of them of fair size and valuable. This shows the importance of occasionally prospecting and cutting into the walls. On one of these veins was a lofty, open, untimbered stope. Here was encountered the porphyry dike which runs back of and parallel with the hanging-wall. Therc were placcs in the tunnel where they contemplated stoping, where the air drill was already in place and about to drill a chute in the roof. The hitches, too, for the

FIG. 8.—DRILL WITH COLUMN USED HORIZONTALLY.

butt ends of the stulls were already cut, ready for the carpenters to lay in the stulls (See Fig. 4). It is the carpenter's business to cut the hitches and prepare and set up the stulls and lagging.

In Umtali, Mashonaland.

From Umtali, Mashonaland, South Africa, John Jarvis, a Montana miner, writes regarding that far-off region of Portuguese territory:

The town contains several stores, two canteens, a postoffice, two butchers, a baker who is an American negro, a reading room and library, Episcopal church and a hospital. Six troopers of the Mashonaland mounted police are stationed outside the town. They are needed to keep order among the natives.

This country needs a railroad badly. To bring merchandise and machinery from Pretoria or Veyburg is both slow and costly. The distance is about 800 miles from either point. The least time that it can be made in is three months. Sometimes it takes six months in the rainy season. The rivers get too full and the transport riders have to wait until the water goes down before they ean ford them. There has been a good deal of agitating, urging the British South African Compauy to push the railway through the fly country. Oxen and horses cannot live in that part. The fly stings them and after some time they die. Last year the company gave a bonus to pay losses so as to get goods from the seventy-five-mile peg, but it was ouly given to one party, who did very little transporting, while those who risked going to the seventy-five-mile peg and lost their eattle got nothing except what they made transporting. The cost of living here is very high. Decent board cannot be had at less than £8 per month. If you board yourself it might be done for less. Everybody here keeps one or more negro servants to make the fires, carry water from the river and go out and bring in wood for fuel. Their pay is 10s per month and their food, consisting of Kaffir meal (or cornmeal) and meat once or twice a week. They seldom stay more than one month, then you get a green one and you have all your teaching to do over again, and as likely as not you get one from an entirely different tribe, whose language differs. Then there is a job to make him understand. As an example: The word "banga"—a knife—is what the negroes around Salisbury use, while those around here have another word for knife.

The people of Umtali are very enthusiastic over this mining district. Quite a number of people have assured me that this will be "the place."

I believe that this will be a good mining country. It only requires the 50 per cent tax to be done away with. A mining claim here is 150x400 feet, and a person is allowed to peg out ten elaims in a block. If you work the claim yourself, the company takes half the profits, and if you float it into a company they get half the shares. When this law was made it was understood that the money was to go toward building a railroad. We have not got the railroad yet, but still have the tax. I have no doubt but that this outrageous tax will soon be abolished. Then, and not till then, will it be advisable for people to come here. I have made a mistake in coming here too soon. I had far better have stopped in Johannesburg or some other part of the Transvaal.

OREGON papers say that the Isaac Banta gold machine, which is an ordinary sluice box in which chemicals are used to assist in separating the gold from the black sand, is being used with considerable success in black sand beach mining. Five of the sluices are in operation south of Seal Rocks, and others are being made ready to go to work.

THE South African *Mining Journal* vigorously opposes the proposition to make the cyanide process a Government monopoly, with royalty to be ebarged all nsers thereof. Speaking of the African Gold Reeovery's part in the proeeedings, it says:

"We are quite ready to admit that tbe company is the only manufacturer of cyanide who has stood between the ring of European manufacturers of that article and the mining industry; and that by refusing to join the ring it bas kept the price of cyanide down to 2s 1d when it would otherwise have been raised 4s or more. In that respect, in the fact that it has retailed cyanide to its lessees at eost price *plus* 10 per cent for incidentals, storage, etc., looking only to its royalties for its profits, it has deserved well of the indnstry, and its adaptability to keep the price down should have been allowed for in the negotiations which went on for the reduction of tbe royalty; for, if the compauy had gone into the ring, the indnstry might have had to pay, not £250.000 per year for its cyanide, which is the present approximate rate of consumption, bnt £400,000 or £500,000.

"But in secretly negotiating with the Government for this new monopoly in place of its patent, has it still adhered to its old principle of profits from royalty only, and not from cyanide? What gnarantee have we that the State monoply price of cyanide will not be as artificially fixed as that for dynamite, and this on top of tbe ontrageons royalty of 25 per cent which it is proposed to exact from all the gold won by its agency? Tbe stone, to employ the simile already suggested, is, in very truth, now in the hands of an insatiable and reckless Government. We may be perfectly certain that it will be carried to its most mischievous goal. Cyanide gold will presently not be worth prodncing at all. Let Mr. Kruger bear in mind the nnassailable economic trnth that there is a limit of taxation beyond whieh it ceases to become productive of revenne, and that he may heap tax after tax npon tbe industry, only to find that with every fresb one he devises the return to Government is growing steadily less. He may drive foreign capital out of the country—if capital is willing to go withont a struggle. There is one other aspect to this matter, which is of no trifling importance. All stimulns to the research after improved methods of gold recovery will be withdrawn if this new monopoly be constituted. Cyanide of potassinm as solvent and zinc as precipitate might be put out of date any day by some new discovery of science. It will certainly be the intention of Governmeut to provide for that obvions contingency. All recovery processes, existing or in futnrity, will doubtless be comprehensively included in the monopoly. The State, in the case of dynamite, has resolved to appropriate to itself the sole right to manufactnre auy improved explosives which may be invented in the futnre, and patentees are warued off. So it will be in the case of gold recovery processes; so that local inventors may well cease from their labors and enterprising companies may cease to finance them. Can the European investor read of these things, and not ask himself what the end will be?"

THE British Columbia *Miner* thinks that the Canadian Governmeut ought to aid the miniug industry in tbat province to tbe extent of buying diamond drills, to be leased to responsible parties at a reasonable rental. It says: "In the Kootenay the Government might establish one or two drills, under the care of tbe Gold Commissioner, to be let out to individuals at a rate of hire sufficient to pay interest on the cost of investment, proper secnrity being given for its safe return. It is possible tbat it might be advisable for a man skilled in its nse to accompany the drill, and his wages would have to be paid by the borrower. Under an arrangement of this kind the Government, thougb it would be pnt to some little expense at first, wonld find it a good investment, and to tbe public it would be of the greatest advantage. Prospects conld be proved and the direction of fnture developmeut on claims determined."

A CONCRETE ILLUSTRATION of the abstract "being out and injured" is afforded in the ease of H. H. Bancroft of this city, non-suited tbis week in the Superior Court. Some years ago there was a fatal elevator aecident in his Market street building. He compromised the damage snits brought by paying nearly $30,000. He then sned the San Francisco Tool Company for that amount aud $100,000 damages, claiming that they had put in a defective elevator. The defendants claimed that their work was done properly and that plaintiff had misnsed it. Plaintiff's evidence being all in, defendants moved for a non-suit, on the ground that the eomplaint was filed too late, and that the action was barred by the statnte of limitations. The motion was granted, the judge stating that the cause of action accrued at the time of the aceeptance of the design and not when the aecident occnrred.

THE Bank of England uow declines to receive silver exeept at a discount of one-qnarter of one per cent.

An Idaho Bonanza.

The De Lamar Mining Co. in its report of the year's work gives the following statisties:

Wet tons erushed, 39,053.58; dry tons erushed, 35,053.07; assay value of the ore milled: gold, $19.87; silver, $11.93; total, $31.80 per ton; pereentage saved aeeording to assay, $82.63 per eent; aeeording to bullion returns, 81.89 per cent. The pure gold prodnced was 26,483,313 ounces; fine silver, 509,169.19 onnces. The value of gold at $20.67 per onnce was $545,489; and for slag and residues, $6448, making a total of $551,937. The valne of silver at $0.71085 per ounce was $358,473; add for slags and residues, $2427, a total of $360,900. The mill was in operation for the year altogether 335 days 22 hours. The average ore crnshed per stamp per day of twenty-four honrs was 3.48 tons. There were 210¼ tons smelting ore sold, the retnrns on whicb were $117,-274; charges, $38,166; profit; $79,108.

The costs of mining, including prospecting and development work, and all other costs and expenses, direct or proportionate, amonnt to $5.9295 per ton. The costs of milling, inelnding all labor, snpplies and all proportionate expenses, amount to $5.9945 per ton. Total costs per ton, $11.9240, showing a decreased eost for the year on mining of $1.1871, aud on milling of $1.5067; total, $2.6938. In calculating the valne of the ore treated, the price of gold and silver products was based on the average priee realized by the bullion returns, $20.67 per ounce for gold and 71.085c per onnce for the silver.

The total receipts for ore worked and sold were $1,039,369; working expenses, $458,250; profit from working, $581,119. The average amount realized was $26.08 per ton worked.

The revenne accounnt of the Londou offiee gives the following statement: Receipts at mine, £212,116; London office, exchange, etc., £1,524; total, £213,640. The charges at mine were £93,520; London office, etc., £4,954; total, £98,474, leaving a net balauce of £115,166. From this there was used for pnrehase of claims, new machiuery, hotel fire, suspense account, etc., £15,598, and for dividends, £90,000; a total of £105,598, leaving a balance of £9,568. Adding, £30,759 brougbt forward from previons year, leaves a net balance of £40,327 forward to current year.

The directors' report says: The average price realized for silver was 71,085c per ounce, as compared with 84.450c the previous year. the highest figure touched being 84.02c and the lowest 59.13c. The price obtained for shipping ore suffered a similar depreciation. This fall in valnes represents a loss of abont $90,000 as compared with the previous year, or 4½ per cent on the capital of the company. Compared with three years ago. when the property was acquired and all calculations were based on silver at $1 per onnce, the difference is $200,000 aud on the same basis the loss to the company on the three years' operations amounts to no less a sum than $340,000. Under these circumstances it is gratifying to find that as the mine is developed in depth ores carrying a larger proportion of gold preponderate, for while the production of silver shows an increase of 22,032 onnces, or say 4 per cent, the production of gold has incrcased by 7460 onnces, or say 40 per eent, as compared with the previons year. In values tbe ore milled has yielded 60.46 per cent gold and 39.54 per cent silver, against 52.09 per cent and 47.91 per eent in 1892–93.

Very Inconsistent.

The Marysville *Appeal*, in a lengthy editorial on tbe telegram from Caminetti, saying that it is proposed to appropriate $100,000 for the restraining of debris on condition that the legislatnre of California appropriate a like sum, in the course of argnment says:

"The people of the valley will never have peace, nor will the impending ruin to the rivers be obviated so long as it is proposed to mine by the hydraulic process and dump into the rivers with or without restraining dams."

How is this, Brother; not long ago yon admitted, through yonr editorial colnmn, that hydraulie mining *could be carried on without material injury if only proper dams were built.* The truth is you jump whichever way the boss holds out his finger. Why can't yon be consistent for once in your life?—Monntain Messenger.

A New Amalgamator.

E. D. Roth, of Denver bas invented a uew amalgamating machine, consisting of a pan, the bottom of which is nearly convex in form, thus giving the greatest depth nearest its circumference. From the center of the pan rises a tnbe ten inches in diameter, and in the interior of the tnbe is a donble, left hand screw attached to a vertical shaft geared on top and with four arms at the extremity that rest in the pan.

The ore to be treated is first redneed to a pnlp and run through a screen of forty mesh to the inch. It is theu conveyed direct to the tnbe and is earried by the aetion of the donble screw into tbe bottom of the pan, wbich has previously been provided with a supply of qnieksilver. The four arms on tbe lower end of the shaft are eacb fitted with a knife arrangement that cuts the qnieksilver, each knife becoming a mechanical "riffle" as they revolve in the pan.

It is claimed tbat the aetiou of the double screw aceomplisbes a result that has been the aim of every amalgamator—that of placing the pulp below the qnieksilver in the pan by direct action, and in snch a manner as to avoid "flonring" the quicksilver.

The machine is intended to make not more than twenty-four revolutions per minute. As amalgamatiou is being accomplished the quicksilver is drawn off and a fresh supply introduced without stopping the machine.

The machine has receutly received an exhaustive test in the sandbars of Snake river, a number of them are being operated there.

From Cripple Creek, Col.

Under date of July 25th, F. H. Pettingill writes from Colorado Springs, Col., as follows:

With few exceptions stagnation unquestionably prevails throughout the entire list of quoted stocks. Of course, the increasing eastern demand is apparently having some effeet, but sellers are so numerous that it takes a phenomenal demand to create any marked advance.

There are a few tbings I shonld like to correct regarding the Ela Heclna Gold Mining Company of Cripple Creek. There is considerable enthusiasm evident regarding this property, but it is not in a condition to warrant many of the stories circulated regarding it. The company are down about fifty feet, and have a five-foot vein from which assays have been taken running from $6 to $500. The ore body is not continnous, nor is it compact enongh to take out a shipment, or even a mill run.

Mr. J. C. Dickey, the manager, has great expectations at farther depth. Other thau that there is nothing special transpiring. The property is steadily working, has considerable funds in the treasury and is being economically and intelligently conducted.

Pbarmacist is stronger; this is occasioned by a rumor that tbe Jones-Miller factions have come to an understanding by the former disposing of his interests to the latter. Whetber this is authentic or not I am unable to ascertaiu, as both parties decline to discuss matters.

There is one point which is having a bearish effect upon tbe market, and that is the continued disposals of collaterals by money lenders. The abandonment of many paid options is a disturbing element that is enconraging and has made short sales profitable.

From personal observation I am inclined to believe that Cripple Creek has not been in an equally flattering condition for a year. There are apparently more mines in operation, a larger number of miners employed and a greater amount of capital going in to-day than ever. Dividends are being pnt iuto the ground in developing new properties. Prospectors are more numerous in formerly unknown localities than ever. Transportation is going down. Intelligent mine operators are flocking to the camp from every otber mining district in the conntry.

On the whole, it is time that all sbould drop their bearish notions, as there is nothing to feed them on. A boom is soon to come, and it will arrive thirty days sooner than anticipated by the most hopeful.

Several facts are becomiug known that tend to create a sbarp competition between the two railroads entering the camp. Should this come abont, the cost of shipping ore will be greatly reduced.

Yours respectfully, F. H. PETTINGILL.

THE sale last week of the Ibex mine in Detroit district, Utah, illustrates the advance in values susceptible in a mining property when its real advantages and capabilities are set forth. In August, 1890, S. F. Mount, of Richfield, Utah, bought the property for $4000. It was systematically explored to a depth of 200 feet, the ore carrying gold and copper, the gold running $24 a ton, the copper averaging five per cent. It is a lime formation, no apparent limit to the ore body. Last week it was sold to Q. P. Posey and others, of Denver, for $135,-000. They will build a smelter at Oasis, on the Sevier river; iron and other fluxing ore being within easy reach. Anotber thing illustrated by snch development is that it results in putting $1000 a day into circulation for labor and supplies.

THIRTY-FIVE ponnds of giant powder exploded in the Golden Gate mine at Sonora, last Tnesday, killing L. Carr and J. Mahngram. The cause of the explosion is uuknown. The men went to charge and fire several holes in a drift in 350 feet on the 400-foot level, and had only been in the mine a short time when the explosion took place. Great qnantities of smoke shot up from the main shaft, and so great was the conenssion that all the lights in the drift at the 200-foot level were extinguished. The dead body of Carr was found some distanee from where the explosiou occurred. Ouc leg was torn from his body and the other nearly so, and tbe body was badly mangled. Mahngram was literally blown to pieces.

Nevada's Gold Prospects.

In many places on the Pacific coast, says Dan De Quille, a great fuss is made about gold quartz that yields from $5 to $10 a ton. Here but little is thought of such prospects. In regard to some of the gold belts of Nevada, I find the following notices in the local papers for the past three days:

Three and a half tons of ore from the Palmico mine, Hawthorne, yielded $4050 in gold.

A lot of fifteen tons of ore from the Irish Boy mine, Kennedy district, sent to Selby's smelting works, San Francisco, for reduction, paid $512 a ton. The vein is from two to four feet wide.

A ledge, just found, a mile and a half from Unionville, Humboldt county, assays from $140 to $1800 a ton in gold. The vein is two feet wide.

In Lincoln county, Scott Allen accidentally found a vein of iron-stained quartz. He did not think much of his find, but an assay showed that the material contained over $3000 a ton in gold. This find was made in a section of country some distance south of where Captain De Lamar is operating.

These paragraphs are in regard to only a few districts or sections of the many gold belts. In the Kennedy district—first discovered in July, 1891—are the Cricket, Imperial and many other mines as rich as the ones mentioned above. Indeed, it is a region full of rich veins of gold-bearing quartz, and finds are still being made almost every week. No place in Nevada is more worthy of the attention of the capitalist or prospector.

A railroad down through Nevada—as one that would connect Salt Lake City with Los Angeles—would open up many good gold camps. The whole route would be through a region full of mines of the precious metals. Down toward Death valley lies Montgomery district, a good gold camp, but one that is almost out of the world as regards transportation.

Also down near Death valley, in Tule canyon, some rich gold mines should be opened up. On this canyon rich dry diggings were discovered some fifteen years ago. In 1880 a few men were at work there. They had no machines for dry washing, and did not even winnow the dirt by tossing it up in the wind, Mexican fashion. They simply dug over the ground with picks, collecting such pieces of gold as they happened to see. In this way they made good wages in ground from two to four feet deep. Working in this rude way they found one nugget that weighed five pounds, and very many worth from $5 to $75. Pieces of gold worth about fifty cents were about the smallest saved working in this way, "by eye." With water, or even dry washing machines, such ground should have paid immensely. As all the placers in the Great Basin region are of local origin, Tule canyon must cut one or more large and rich veins of gold-bearing quartz. At present we hear but little about these diggings, though there is always more or less gold coming from them, which is said to be ground out in arrastras by some of the ranchers living in the vicinity.

In the early days an impression prevailed among our miners and prospectors—mostly from California—that the gold veins on this side of the mountains would not prove permanent. They said it was merely a surface production and would not hold out in depth. This soon came to be accepted as an established fact, therefore little attention was given to veins that were purely gold bearing by those who went forth on prospecting raids. Now the truth is that our gold mines are the most permanent in the country. The first gold mines opened and worked were in Devil's Gate district, at Silver City. These have been worked right along unceasingly for over thirty years, and to-day are paying their owners as well as at first. Wherever paying gold mines have been found in Nevada they are still paying, as in the beginning, and this is more than can be said of many of the silver mines.

Chinese Hydraulickers in Contempt.

In the contempt proceedings entitled the County of Sacramento vs. James Gould et al., says the Marysville *Appeal*, judgment has been rendered in favor of the plaintiff by Judge Davis.

Ah You and Ah Joe, two of the defendants who failed to appear or show cause as directed, were each fined $500, and in default of payment were ordered to be imprisoned in the Yuba county jail one day for each $2.

The defendants were mining on Deer creek, Nevada county, on what is known as the Red Diamond mine, the debris flowing from Deer creek into the Sacramento river.

Fraudulent Assays.

The Park City *Record* learns of a case of dishonest assaying which, if true, should place at least one assayer at Lehi behind the bars. A miner had a prospect at Tickville, and sent samples of his rock to the Lehi man to be assayed. He got a return of $2 in gold to the ton. This stimulated him and he worked hard, sending other assays from time to time, and getting increased returns, the last showing $16 to the ton in gold. He had some thirty assays made, and as all showed gold, he decided to get capital interested with him, so he took some rock and started to find assistance. He had it tested by a competent assayer, and was surprised and pained to learn that the best of it only showed a slight trace. He sent some to Park City and got the same results, and then realized that the Lehi man had given him false returns, and that he had been wasting time and money in developing a piece of ground that contained absolutely nothing. There should be some means of dealing out justice to such tricksters, for a man who will be guilty of such dastardly work is not fit to be at large.

Death on the Desert.

W. H. La Pearle writes from Bullionville, Nevada, as follows:

"I left Vanderbilt, Cal., 300 miles from here, afoot. Part of the way I came afoot and the rest of the way I walked. I had a jackass packed with a little bacon and flour and a canteen of water and then struck out into the desert. It was a tough trip. I had one tramp of sixty-five miles without water, except my canteen full, and the sun beat down on me redhot for two long days; with not a living thing in sight. I tramped steady for two days and one night, getting across that piece of landscape.

"I had quite an exciting experience the last day when within about six miles of water. I met a crazy prospector. He had his clothes off and was digging holes in the sand for water. When I came towards him he told me to look out, for the water was very deep. The poor chap had been without water for so long that he had gone crazy. I poured a little water out of my canteen for him.

"As soon as he saw the water he jumped on me like a mad dog. As I fell I managed to put my hand on a rock, with which I hit him on the head. He came to in a few minutes and I got some water into his mouth. Soon after he fell asleep. Every few minutes I would pour some water into his mouth, until it was all gone. I had only a pint when I met him.

"I knew it could not be far from water, so I took my pack off the jack and got on him and struck out. In a little over an hour I found the water. I never saw an animal drink like that jack did. I filled my canteen and went back to my crazy man, who was still asleep. I got some more water down him and wet his head. I watched him all night, and I tell you it was a long, dreary night, sitting out on the desert with a crazy man. By morning he had recovered his senses. He told me he had a partner, and they had got lost on the desert. He could not remember where he left his partner.

"After we had had a bite to eat, as he was too weak to go with me, I struck out alone to look for his partner. I found tracks leading right away from the water. I followed them about three miles, when I came to the poor fellow, lying on his back, dead. I dug a hole in the sand and put him in and covered him up as well as I could and went back. My wild man being able to walk a little, we went to the Indian reservation and told the Indian agent about the dead man and then came here and we both went to work."

Outward Bound.

The American and White Star lines have established a $10 rate from New York to Liverpool and Queenstown. The Chicago *Journal* says the news of the cut rates has reached that city and many of the people thrown out of employment by the strike are preparing to take advantage of them. Local steamship agents tell the Anaconda *Review* that a heavy exodus to all parts of Europe has set in. "Times are much better on the other side just now," one of them remarked. "We have sent abroad several thousand miners from Montana and Idaho who have been attracted to the rich gold fields of South Africa, and the stream of travel is all one way now, outward bound."

Pacific Coast Tide Tables.

The tide tables for the Pacific Coast of America, together with statistics in Asia, Australia and islands of the Pacific ocean, for the year 1895, published by the United States Coast and Geodetic Survey, are now ready for issue, and copies can be had for 25 cents at the agencies of the survey in this city, or by addressing the office of the survey at Washington, D. C.

THE quartz mine belonging to Birdsey, Knott & Swinden, Blackwell district, near Gold Hill, Jackson county, Or., was sold to Chapman Bros. of California, for $20,000. The ledge is 3½ feet wide, and shows much free gold. There are 40 tons of picked ore on the dump, which, it is claimed, will assay $50 to the ton. The original company has a lot of rich ore not included in the sale, expected to reach into the thousands when crushed. The purchasers intend to sink 100 feet, and if it preserves its width and richness at that depth they will put up a 10-stamp mill.

A Paying Mine Property.

The Salt Lake and Mercur Railway Co., has been organized with $100,000 capital to build a nine mile broad guage road from Fairfield on the U. P. to the Mercur mine.

As a mining property the Mercur mill and mine is unique. The mine is a great blanket deposit, with a slight dip, and so easily worked through the half-dozen tunnels run in on it as to make the cost of ore extraction almost nominal. Persons who have explored the tunnels and the rooms of a Western coal mine can get an idea of the manner in which this mine is operated, in being so similar, except that up to the present the rooms are lacking, the workings consisting only of tunnels, with parallel drifts, similar in size, and here and there crossents to make air courses, just as in a coal mine. The opening of rooms through extraction of ores will come later, and in time all will be drawn out, the same as are the fillers of coal left in coal mines to support the roof till after the miners have gone as far as desired and are working backward.

There is another difference between this mine and coal mines, in the fact that in the latter there is large waste in the slack and worthless bone, while in the Mercur there is but little waste to cast on the dump.

The ore from the Mercur runs from five to eighteen feet in thickness, is very easily broken down, even in running the six-feet-wide drifts or tunnels, and of course, in what miners term stoping the process of extraction will be still easier. The ore is very silicious, and carries its gold in such minute form as to make extraction of the metal easy under the cyanide process, wherein it is leached in great tanks and the gold deposited by action of zinc shavings.

While the company has prospered ever since they learned how best to extract the gold, they have labored under great difficulties in having to haul ore so far to the mill, and the extra cost of fuel taken by team from the railway up grade. The mill, in June, reduced about 3,000 tons of ore, an average of 100 tons per day. This was the best month's work so far with the mill.

The mill has paid such profit as to allow bi-monthly dividends of $25,000. It is proposed to remodel the mill so as to increase the present capacity of 100 tons per day up to 250 tons. This is to be done in such improved manner as to make the cost of operating not much above what it is now, as far as labor is concerned. The mill is provided with an engine which still has surplus power after the enlargement. Part of the old mill will be torn out and changed by additions to the structure, so as to dump ore into the top and permit it to pass automatically down through the rock-breakers, the rolls and then to ore bins, from which to be drawn into the tanks to be leached. This will do away with the elevators now in use and make the handling of ore much easier and more convenient.

COLONEL NICK TREWEEK yesterday returned from the East, whither he has been in the promotion of an enterprise which if successful means increased thousands for Utah mining properties. That it was the wrong time to place properties, no matter what their merits, however, was not long in dawning upon him after crossing the Mississippi. Threatened derangements in the tariff, discrimination against the white metal and finally the strike, has forced capital into perfect retirement pending the adjustment of these problems, and until they are adjusted there will, says Colonel Treweek, be but little capital coming westward. He takes the situation hopefully, however, and reads in the signs of the times a strong demand next year for Western investments, especially those that have reference to gold mining, placer and lode.—Salt Lake Tribune.

DIVIDEND No. 5 of twenty-five cents a share was recently paid on Silver King mining stock. It aggregated $37,500, or $187,500 to date. The *Tribune* gives as the reason why the King can pay such profits, in view of the low prices of silver and lead, is that the ore is much sought after by the smelters for its high-class fluxing qualities. It also carries considerable gold, and the fact that it is a dry mine lessens the working expenses. While the shaft is being enlarged the output will fall off, but on completion of this work and the other improvements under way the Silver King will be in a position to double its shipments and resume the payment of dividends.

DURING a big storm at Mercur, Utah, two weeks ago W. G. Adamson, a prospector, met with a peculiar experience. He was working in the bottom of a 50-foot shaft when the storm came up, and his partner, who was on top, told him he had better come out. He refused, saying he was better off there than on top. His partner sought shelter in a clump of cedars a short distance off, and soon water, mud and boulders were pouring down the canyon. Soon it began to run into the shaft and Adamson was kept busy treading water, dodging rocks and howling for help. His partner finally heard him and hoisted him out, and before the storm was over the shaft had 20 feet of mud, water and rock in it.

Scientific Progress.

Dust in Nature.

Without dust there would be no blue firmament; the heaven would be blacker than we see it on moonless nights. On this black background the glowing sun would shine out sharply, and the same sharp contrast of intense light and deep shadow would characterize the surface of the earth. There would be nothing to subdue this sharp contrast but the moon and stars, which would remain visible by day. The illumination of the earth would be similar to that which we observe when looking at the moon through a telescope, for the moon has no atmospheric envelope aud consequently no dust iu suspension. It is due entirely to the dust that we enjoy our soft, uniformly diffused daylight, for which our eyes are specially adapted; and it is the dust which contributes so much to the beauty of the landscape. But while the foregoing explains how the dust makes the whole vault of heaven light, it does not explain why it is chiefly the blue rays of the white suulight that are reflected, and only to a small extent the green, yellow and red rays. This is dependent on the size of the dust particles. It is only the finest of them that are borne by the air currents into every stratum of air, and it is only these fine, widely diffused dust particles that are of auy significance in this conuectiou. Now, let us consider the mechanism of light and the extreme shortness of the ether waves which constitute its essence. These waves, although all microscopically small, vary considerably in length. The fine atmospheric dust includes many particles large enough to reflect the short blue ether waves, fewer particles capable of reflecting green and yellow, and still fewer large enough to influence the long red ethereal waves. The red light, consequently, passes through the great majority of the dust particles comparatively unhindered. The blue rays, on the contrary, are intercepted and diffused, and so become visible. This is the reasou that the finest dust—and so, too, the firmament—appears blue.

So, then, the finest dust appears blue. You may observe that the wreath that curls upward from the burning end of a cigar is blue, while the smoke drawn through and exhaled is whitish. The particles in the latter case have uuited and become large enough to reflect white light. So, too, in the country, on a clear day, the sky is blue; but in the city it appears whitish, because of the greater number of coarse dust particles in the air. It is especially on mountain heights that the sky is so intensely blue, because the rarefied atmosphere supports only the finest dust particles. At a great height the sky would be almost black if there were no dust particles in suspension. We see it grow pale as we turn our eyes to the lower strata of air toward the horizon. But why is the sky in Italy and in the tropics so much deeper blue than with us? Is the dust finer there? As a fact, it really is. Not that finer dust rises there, but in our climate the dust particles are soon saturated with water vapor, which makes them coarser. In warmer regions, however, the vapor retains its watery character and does not condense on the floating dust. It is not until the aerial currents have borne it to higher aud colder regions that it is condensed to clouds.

This brings us to the most important role played by dust in our atmosphere; its influence in determining rainfall, due to the fact that vapor fluidifies upon the dust particles. It may be accepted as beyond questiou that of all the water evaporated by the sun from the surface of land and sea, not one drop returns which has not condensed upon a particle of dust as a nucleus. This is easily demonstrated. We fill a large flask with air which has been filtered through cotton waddings until all the original dust is driven out and the flask is full of dustless air. Into this dustless air turn a current of steam from a kettle and you will find it transparent and therefore invisible. Not a trace of the cloudy appearance we associate with steam. The only thing noticeable is that the inner walls of the flask begin to drip; the vapor condenses here as it cools, because there is nothing else for it to condense on. But blow ordinary dust-laden air into the flask and the vapor at once assumes the familiar cloudy appearance due to its condensation on the dust particles, and it begins to rain in the flask. The reason for this is that the vapor condenses on the dust particles and freights them until they sink as rain drops.

Without dust, then, we would have no fog, no clouds, no rain, no snow, no brilliant-hued sunsets, no cerulean sky. The surface of the earth itself, the trees, the houses, along with man and beast, would be the only objects on which the vapor could condense, and these would begin to drip whenever the air was cooled sufficiently. In winter everything would be covered with a crust of ice. Our clothes would become saturated with water condensing upon them. Umbrellas would be of no avail. The vapor-laden atmosphere, moreover, would penetrate to our rooms and condense upou the walls and furniture. In short, the world we live in would be quite another world if there were no dust. Since scientists began to realize the important part played by dust in the economy of nature, measures have been taken to count the particles in a given space. In Loudon and in Paris at the surface a cubic centimeter has been found to contain nearly a quarter of a million particles. On the top of the Eiffel Tower there are about half as many, while in the high Alps there are only about two hundred particles to the centimeter. A great deal of the dust at high altitudes is cosmic dust, consisting, like the meteorites, of carbon and iron.—Die Gartenlaube (Leipzig).

Accidental Inventions.

Some of the most successful and remarkable engineering enterprises have been claimed to owe their existence to circumstances which, when considered in themselves, seem far too trivial to have produced such important results. Though opinions be divided as to the first transmission of power by electricity, for example, it has been strenuously maiutained in some quarters that accident, pure and simple, was the cause of the great discovery, aud an interesting story has been told for many years of the atteuding circumstances. This is to the effect that at the Iuternational Exhibition at Vienna in 1873, the Gramme Compauy exhibited two dynamo machines for plating purposes. One of these machines was in motion, and a workman who noticed that some cables were trailing on the ground, thinking that they belonged to the second machine, placed them in its terminals. To the surprise of everybody this second machine immediately began to turn, and it was then discovered that the first dynamo was driving the second. It would be strauge, indeed, if there were not other versions of this story, and, accordingly, we find several somewhat different accounts, from all of which, however, it would appear that the development of any measurable power in a machiue taking its supply of electricity from a primary dynamo was something wholly unexpected and correspondingly startling.

Closely analogous is the narrative of the origin of one of the most successful foundry blowers now in use, according to which the inventor was attempting to construct a water motor which persistently refused to go round when the water was turned on. In the determination to learn what was wrong, a belt connectiou was made with a line shaft so that the motion of the machine might be studied. By the same means a reverse motion was given to it, and the way in which it threw the water, and, after the water had beeu exhausted, drove a current of air, suggested au entire change of purpose, and the machine was finished aud put on the market as a blower instead of as a water motor, and thousands have been built since. The story, often told, with various modifications of detail, serves as an additional illustration of the fact that inventors frequently stumble upon success in entirely unexpected directions.

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Mechanical Progress.

New Electric Locomotive.

There is an electric locomotive in course of construction in Boston, which promises to meet all the requirements for propelling railroad trains. It is an eight-horse power machine, and it is unique. The distinctive feature of the invention is the substitution of a piston and cylinder in place of the usual rotary motor for the application of power. The cylinder is much lower than for steam purposes, and has in its interior a series of magnets. The piston passes entirely through the cylinder, with crossheads at either end. On the piston within the cylinder is a series of armatures of peculiar construction. On the axle of the driving wheels are commutators, whose functiou is to apply and cut off the electric current, just as the eccentrics control the steam of a steam engine. The principle of the machine is the admission of the currents to the maguets in the cylinder, which are in advance of the piston rod, and by their action on the armatures the piston rod is moved forward. As the stroke is ended the current is cut off from the magnets first charged and applied to those at the rear of the piston, giving it a reverse motion, thus maintaining a strong, regular motion. There is absolutely no back pressure from the electric current, while in a rotary motor this is estimated at twenty per cent of the force applied. It is practicable to run the machine at 200 revolutions of the axles per minute, and with a driving wheel eight and one-half feet in diameter and the crank-pin three feet from the center there would be a six-foot stroke under a full head of power. The machine is adapted to receive the electric current either by a trolley wire, a third rail in the track or from a storage battery.

THE vast engineering enterprise now being carried out for the utilization of a part of the energy of Niagara has stimulated attention to the subject of water powers all over the country. Many of them are being quietly bought up and others are very freely discussed, while on a third class heavy expenditures are already being made. One of the most ambitious of these projects is that for which a big dam has been thrown across the Colorado river, near Austin, Texas, by municipal funds, and which ouly depends for its completion on the raising of the full $1,500,000 voted by the citizens. This dam is of solid granite and limestone masonry, 1150 feet long, 66 feet wide at the base, 18 feet wide at the top, and 6 feet high above low water. By its meaus the river at this point has beeu turned into a lake 30 miles long, in places 2 miles wide. It is estimated that 100,000-horse power can be furnished wheu the plant is ready, aud one mildly wonders what Austin, a city of but 25,000 people, is going to do with so much, unless it should attract manufacturing industries from all over the South by its cheap power.

THE lapse of the Edisou incandescent lamp patents in Europe has had the effect of bringing so many new, cheap and bad lamps on the market that all the manufacturers there are agitated. These patents and those ou the telephone have beeu the only electrical ones that have beeu sustained by the courts, aud uow that they have run out the temptatiou to enter the field appears to have overcome commou prudence; hence incandescent lamps have sold in London at fourteen cents apiece. The lowest price in New York is at least twice as much, aud is admitted by experts to be fair. A union is now being formed at Berlin to which all the leading lamp manufacturers of Europe have given their adhesion, which will probably prevent further cutting. The price is likely to be about that which now prevails in America. The complaint is made that fixing the price is a small matter compared with fixing the voltage. Instead of a few standard voltages being in existence, there are literally scores, all of which complicate matters, it is said, and add greatly to the cost of production. The point is made that in Europe, or at least in England, the unit of illumination for a lamp is ten-candle power, whereas in America the unit is sixteen-candle power—another instance, it is alleged, of American extravagance and abseuce of economy.

BUT one of the two mangauese mines in California was in operation in 1893, the one near Alameda, in Alameda county, which produced 400 tons carrying about sixty-five per cent of binoxide, the value at the mines being $2000. As has heretofore been stated, there is but a small demand for manganese ores on the Pacific coast, chiefly for use in the manufacture of chlorine gas to be used in workiug sulphuret gold ores. The total amount of mangauese produced in California up to the close of 1890 is estimated to be between 6000 and 6500 tons. This estimate is made on the basis that 5000 tons was mined for shipment to England from 1867 to 1874. After 1874 only small amounts were produced each year, none being produced in 1892, and in 1893, as stated above, the product was 400 tons.—J. D. Weeks in Mineral Resources for '93.

M. MOISSAN recently described a reverberatory electric furnace, the esseutials of which are a block of limestone hollowed out and lined with plates of magnesia and carbon, the carbon being the inside lining. A lid of like structure covers in the cavity. Electrodes pass through slots cut in each side of the block, and square with them is a tube of carbon from one-half to oue inch in diameter. The arc passes about one-half inch above the tube, and, by tilting it, the reducible material can be passed through from the high to the low end, and the furnace thus made to work continuously. M. Moissan obtained two kilograms of chromium iu an hour with 600 amperes and 60 volts.

A NEW YORK INVENTOR has introduced a new method of keeping up the incandescence of electric glow lamps. The current is not contiuuous, but is divided up, as cyclostyle writing is divided into dots. The lamp has no time to cool down when the current comes through it; but in the meantime the current has, in the same manner, been supplying other lamps on another circuit. By means of a rotating commutator at the central station, the nccessary switching on and off is, we understaud, accomplished at the rate of about seveuty times a second.

THE following is a description of the Bernardos process of electric welding: The article to be operated upon is connected to one terminal of the dynamo, while the other terminal is a carbon rod, the movements of which are controlled by the workman. By this an arc is formed between the metal and the carbon pencil, and this latter becomes the equivalent of an electric blowpipe, fusing the metal, melting together seams, and even cutting out sheet metal into patterns.

IT has been shown by recent experiments that there is practically uo difference in cost between cooking by electricity and by coal, while the advantages of the former method in point of comfort, cleanliness and safety are considerable. Of every 100 tons of coal burned in an ordinary cooking stove ninety-six tons are, it is said, practically wasted, whereas with electricity the expeuse is not so much on the fuel as on labor and interest on machinery.

THE Western Union Telegraph Company has absorbed the American Rapid Telegraph Company and increased its capital stock 5500 shares in payment for the same. The property of the American Rapid Telegraph Company consisted of 2684 miles of poles and 20,370 miles of wire, extending from New York City to Boston, Buffalo, Cleveland, Pittsburg, Chicago, Washington and intermediate points, with office equipments and rights of way.

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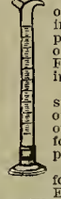

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL NOTES—*Ledger:* R. H. Browning of El Dorado springs, Missouri, has purchased one half of the stock held by Chas. Peters in the Good Hope Mine. The contract is that the mine will be opened in thirty days.

The Hancock company will be incorporated in a short time. The people who recently purchased the property from C. O. Mitchell of Sutter Creek have already ordered a 20-stamp mill from the Risdon Iron Works, and extensive supplies from San Francisco. The entire apparatus for working the property will be on the ground inside of 30 days. This property has a ledge exposed for 2000 feet which is 20 feet wide, and the croppings of which will show gold at any point. Miners who are familiar with the property consider the prospects good for a large mine.

Messrs. Cross and Poundstone spent a part of the week at the Gover mine in conversation with those interested in the attachments upon the Gover. Mr. Cross represents the Hobart estate which is interested with Haywards and Lane in the Utica and other mining ventures. These people desired to allow the balances in the hands of the sheriff from the clean ups he has made on the property, after the sheriff's fees are paid to go pro rata to the payment of labor claims; they to take the mine on a ninety day trial, and if satisfactory to take the property and pay the balance of the labor claims out of the earnings of the mine. If the miners consent to the arrangement the property will be placed in charge of Mr. Poundstone as superintendent and work will he resumed immediately.

The mill on the Maximilian mine about one mile east of Sutter Creek will be in a condition to start up in a few days. This is the property of John Bernardis, who brought a three-stamp battery from Jesus Maria and erected it on the property. The mill was made at the Donnelly foundry, being about the last work turned out by that concern, and has been used but a short time. The power will he secured from the Blue Lakes Water Company's ditch, a line of pipe 300 feet long, giving a fall of 750 feet. A 31-inch wheel will furnish the power. The tunnel is 40 feet in on the ledge and is supplied with tracks and car. The construction of a 300-foot ditch is all that is necessary to have everything in running order. Before going to the expense of putting up the mill Mr. Bernardis made a mill test of 50 tons of rock at the Belmont which was more than satisfactory.

THE GOOD HOPE MINE—*Dispatch:* Charles Peters has sold one half of his interest, or 24,500 shares, in the Good Hope Mine to R. H. Browning, and the probabilities are that the work of developing the mine will soon begin. The Good Hope is situated between the Kennedy and Zeile mines, both of which are now paying good dividends, and there is every reason to believe that this will also prove to he a valuable property when it is fully developed.

El Dorado.

GRIZZLY FLATS.—Cor. *Democrat:* Machinery is heing placed on Rocky Bar for the purpose of working a big bed of gravel known to exist there, hut which has been neglected from the fact that it required a little capital to put up suitable pumping and hoisting machinery.

The Mouse Gulch mine, which has heen idle for many years, is now attracting considerable attention, as good milling ore is being taken out.

The Eagle King is being worked, and shows a large vein of good ore.

The Melton mine is waiting for machinery delayed hy the tie-up on the railroads.

Will Murdock and others are opening a har of gravel on the North Fork of the Cosumnes river, which is promising well.

Cap's Crossing, a few miles from here on the North Fork, is attracting the attention of prospectors. Several nuggets of gold have been found in a ravine on the side of the river recently, weighing as much as $126.

Nevada.

OSBORN HILL.—*Telegraph:* The Osborn Hill mine is building a 20-stamp mill. The ledge is looking well. A force of men is at work.

At the Conlon mine the shaft is being put down rapidly. It is now about 300 feet.

There has been a great deal of work done at the Daisy Hill within a very short time. The machinery is all on the ground and will be at work. The shaft is on an angle of 42 degrees, and is now 100 feet deep. It is tapped at the hottom hy a perpendieular shaft 83 feet in depth.

Placer.

ALTA.—San Francisco parties are operating the Cedar Creek gravel mining claim at Shady Run. It is the same as the Damascus lead. A. Rodger is superintendent. It is principally fine gold, and pure, averaging $19.20 to the ounce. Mr. Rodger unearthed one of the largest nuggets ever found in that section, when, some years ago, he found one at Iowa Hill valued at $1250.

Plumas.

PLUMAS IMPERIAL MINE.—*National-Bulletin:* Water hecoming exhausted, the Plumas Imperial hydraulic mine has closed down for the season. Washing was suspended and the hedrock and sluices cleaned up. The yield of gold was satisfaetory, demonstrating that the mine is a valuable piece of property. The company had an immense amount of work to do the last spring, and did uot get to washing gravel until the water season was nearly over. However, a large gravel channel was opened up, containing much coarse gold, as well as a good yield of the finer quality. The compauy owns a large area of mining ground, 1200 acres in all—900 on Hungarian Hill and 300 at Emigrant Hill—embracing extensive and valuahle gravel deposits, and constituting one of the best hydraulic propositions in this part of the State.

During the past year the corporation did much work in fitting up this mine for operation. Connected with it are 16 miles of ditches and flumes, a reservoir at Dean's Valley, and nearly 5000 feet of large pipe, all for the purpose of delivering a big supply of water at the mine.

The restraining works erected near the confluence of Rock creek with Spanish creek are the best to he found in northern California. A large stone dam huilt across a narrow gorge, the sides of which are solid rock, form a deep settling reservoir nearly half a mile long. With practically dead water for that distance, it is impossible for any debris of a hurtful character to pass the dam. The impounding of debris is most complete, thus enabling the company to operate their mine without the slightest harm to the navigable streams in Sacramento valley or to the farming lands in American valley.

Siskiyou.

MINING NOTES.—Yreka *Journal:* The companies at work in the Benz Bar and Fort Jones claims are washing pay gravel. Nearly all the other companies have been washing for three weeks with good success. The river is down to its summer stage. Miners will rush work day and night in most of the claims until the winter storms set in again next Decemher.

The Orr quartz mill on Humbug creek has been kept running steadily for some time lately on good paying quartz.

FROM SALMON RIVER.—A correspondent, under date of July 16th, says James Murphy and John Freelaud have discovered a rich gold mine on White's Gulch, the ledge heing from four to six feet in width, and the ore estimated at $50 to $75 per ton.

Smith and Marion are working their mine on White's Gulch, and are taking out rich ore.

The Golden and Frank mine is running in full blast and paying well.

The Jumbo Co. have started up their mine with a full crew, and taking out good ore.

The Gold Nugget gravel mine has been shut down, water being scarce.

OREGON.

ROGUE RIVER NAVIGATED. — Grauts Pass *Courier:* H. B. Moore of Curry county came up Rogue river in a boat for supplies for their ranch, a distance of eighty miles, consuming forty hours on the trip. Their boat was twenty-four feet long and they were obliged to "line up" over rapids and falls for a distance of teu miles.

They prospected along the banks with pick and pan and anybody can find diggings where fifty cents to a dollar a day can be made with a rocker. The best prospects they struck were down the stream about sixty miles.

They took about 700 pounds of provisions on their down trip and claim that the stream could be made navigable for small boats at very small expense, and that the government could by blasting and locks make Grants Pass accessihle for steamers of good size, even when the water is low.

THE BUFFALO BONDED.—Baker City *Democrat:* A mining deal of considerable magnitude was transacted in Pendleton Saturday, wherehy the Buffalo property in the Granite district was bonded to W. T. Mendenhall of Chicago for $30,000. The deed was placed in escrow at the Pendleton Savings Bank, Mr. Mendenhall having an 18-months limit. The Pendleton parties who own the property are Lot Livermore, S. Rothchild, John E. Bean, C. S. Jackson, Cox & Minor, Thomas W. Downing, William M. Beagle and Harry Dickson.

The property is a quartz formation carrying both gold and silver. The mine is well developed, over 80 feet of tunnels having been run. Mr. Mendenhall will study the character of the ore and decide whether to erect a stamp mill or put up a smelter. He will remain at the property, which is located about 50 miles west of Baker City and 100 miles south of Pendleton, for a month or so, then return to Chicago, and later in the fall will make a trip to Germany.

LONG CREEK.—There is much prospecting going on all through the Long creek section. Many prospectors are going in, more than ever hefore. Sloan & Haskell, Smver and others are doing lots of work. The first mentioned firm recently took out a $487 nugget, and several smaller ones have been found. They have cleaned up $8000 thus far this season. At Brown's mine in Fox valley the output has been this year $10,000. A mill, the Black Butte, is running with ten stamps. The capacity will he increased unless a sale is consummated, which is now being negotiated. The consideration is to be $100,000 for the mill and quartz mine.

WASHINGTON.

A mill run has been made at the Golden on ore from the Triune, in the Okanogan country, saving $15.25 gold to the tou. This is a profit of $10 in excess of the expense of mining and milling.

IDAHO.

IN THE CŒUR D'ALENES—*Miner:* We have no desire to exaggerate the condition here in the Cœur d'Alenes. The plain statement of the facts is sufficient to convince any one that the ordinary civil officers, it matters not how fearless and determined, are powerless to cope with the criminals that infest the country and to protect life and property. Threats and intimidations, coupled with an inordinate desire to make money, have so suhdued public sentiment, which in most sections can be depended upon to support the officers in enforcing the law, until to denounce crime is to invite a hoycott or worse from the element that dominates the country and encourages and protects the criminals. The people of the Cœur d'Alenes are entitled to protection in every right of American citizenship, and the past has certainly furuished sufficient proof that this can only he secured by the presence of United States troops. Steps should be taken at once to establish a permanent post here. This would at once restore and maintain peace.

A PROMISING SECTION.—Boise *Democrat:* The next important quartz-mining district opened will undoubtedly he that of the Half Way House, on the Idaho City road. That point is the radius of a network of gold and silver-bearing ledges, unequaled in extent and value by any camp in the State. Mineral helts, with porphyry and granite formations, rib the hills and mountains everywhere, while water power and timber supplies are at hand. A considerable numher of locations have been made, but development work has progressed slowly for want of means hy the parties holding them. Recently men of experience and able to command unlimited capital have visited and examined some of the prospects.

NOT ENCOURAGING THERE.—Hailey *News-Miner:* G. A. Williams, superintendent of the Atlanta Gold and Silver Mining Co., arrived yesterday from Atlanta. He is now working twenty-one men, and says there are fifteen or twenty more already in that camp looking for work. He advises no workingmen to go to Atlanta for they will be disappointed. He is clearing out a 1400-foct tunnel which has been lying unused for twelve years and which is badly caved—at least as far as he has gone in it, some 200 feet.

MONTANA.

DEER LODGE GOLD MINES.—"The gold production of Deer Lodge county for the year 1894 will exceed that of the past eight years." This statement is made to the Anaconda *Recorder.* The Bald Butte mine is making a profit of $1000 a day. This mine employs fifty men, and has a complete reduction plaut. The Granite Butte, northwest of the Bald Butte, is making a profit of $300 a day for its owners, and employs twenty-two men. At the Cumberland mine a Crawford mill of ten stamps' capacity will be started up next week. The Royal mine will he producing again by Aug. 1st. Placer mining in the county is very active. A great many men are at work in Pioneer, Rock Creek, Ophir, American, California and Washington gulches. A miner named James O'Donnell worked a claim near Champion thirteen days recently and took ont 157 ounces in gold, for which he received $18 an ounce.

A RARE METAL.—S. C. Beebe, in Anaconda, gives the *Railway Review* some interesting facts about a mine recently discovered in the district about twenty miles west of Bannock. The ore of which he speaks is a free-gold quartz, mining from $12 to $20 per ton in the yellow metal. The chief valne of the ore, however, is thought to depend in the metal validium which it carries in large quantities. This metal is worth $1800 a pound, and is of value for coloring. It occurs in small seven-sided crystals, about the size of grains of wheat, and of a pinkish brown color. The specific gravity of the metal is about the same as that of lead. It concentrates readily and three tons of ore have been already run through a concentrator with very favorable results. The ore also carries chloride of lead, bnt not a trace of silver.

Mr. Beebe states that abont $4000 worth of work has already been done on the claim, and the deepest workings are about fifty feet. The vein is a contact formation between quartzite and porphyry, and is about four feet from wall to wall. It is owned hy Mr. Taylor.

So far as known, this metal does not occur anywhere else in the United States. Its treatment so for as this country is concerned would consist merely of concentration, the concentrates being shipped to Swansea, Wales.

BOSTON & MONTANA—This company is better off in regard to material than any other in Butte. Since the operation of the smelter at Great Falls and the shutting down of the smelting works the company uses practically no coal. This company is operating both the Colusas, the Mountain iVew and the Pennsylvania. These great properties give employment to about 700 miners and produce the outut requipred of them with the steadiness of clockwork. The two Colusas are worked principally through the Leonard shaft, which is the largest in the camp. This shaft is eighteen feet eight inches by six feet six inches, and consists of two working shafts four and one-half by four feet in the clear, and a pump compartment four and one-half by seven. It is now 600 feet deep. The smelter at Great Falls is running as usual.

The Butte & Boston is making about 2,000,000 pounds of copper per month and is being operated in a most progressive and energetic manner. Its smelter is principally supplied hy the East Gray Rock and Silver Bow mines. The shaft at the East Gray Rock is now below the 1300-foot level, and sinking is still in progress. This mine is magnificently equipped, and sinking will continue until the 2000-foot level is reached.

THE PENOBSCOT SOLD.—*Inter-Mountain:* The latest important transaction is the sale of the Penohscot mine, north of Helena. The purchasers are New York and Denver capitalists, and the consideration is $125,000. The first payment of $25,000 was made to J. Henry Longmaid, the former owner of the property, and the new proprietors will take possession at once.

The Penobscot is a gold mine and the ore is free milling. It is in the same helt with the Drum Lummon, Bald Butte and other famous gold producers.

THE SUNRISE MINE.—The Phillipsburg *Mail* reports the uew twenty-stamp mill is in operation. The mine is located in Henderson gulch about two miles above the old placer diggings, where thousands of dollars were taken out years ago, and it is now conceded that Henderson mountain and its tributaries furnished the gold for the old diggings that enriched so many pioneer fortune seekers. It is stocked for 500,000 shares.

Several other prospects are under way of development in the vicinity of the Sunrise, and most of them have reasonably good indications for developing into mines. Among the most promising is the Healey property, on the opposite side ol the gulch one mile below the Sunrise.

ROYAL GOLD.—Phillipsburg *Mail:* This mine is northeast of Phillipsburg. The property was originally located by Messrs. Smiley and Swain, two prospectors, who succeeded in getting Willard Bennett and W. W. Turney interested in the property. They were soon convinced of the richness of the property and a deal was consummated with the owners in 1891 whereby they received $13,000 for all their right and title in the Royal Gold. Mr. Turney managed the operations on the property for some time after that, and with a small Huntington mill in use he took out considerable gold and made developments sufficient to warrant operations on a more extensive plan, and last year a ten-stamp mill was huilt. In the meantime Mr. Turney had disposed of all his interest in the property to Willard and Nelson Bennett and Conrad Kohrs, receiving a total of $50,000 therefor.

Willard Bennett then took charge of operations, and to him is largely due the success of the mine up to the present time. He blazed the first trail into the place, and his unfailing confidence in the mine and his willingness to expend money in its development has made it what it now is. When Mr. Bennett took the management the property owed him $40,000, and in less thau nine months' run with ten stamps he had paid off the debt and made the stockholders richer by $70,000 in dividends.

The mill is not now in operation, as the flow of surface water into the tunnel lately has prevented the extraction of ore. The water is slowly receding, however, and thirty men are now engaged in one way or another in preparations to start the mill at the earliest possible time.

The development thus far made consists of 3000 feet of tunnels and drifts, at least one-half of which has heen or is now in ore. It is estimated that at least a half million dollars is now in sight, and as greater depth is attained the vein becomes stronger and richer.

Everything about the place in the way of permanent improvements shows good management and arrangements for economic operations. A tram road of 1000 feet is built from the upper tunnel to the mill, which is operated by gravitation and the ore is conveyed by it at a cost of less than three cents per ton. The superintendent is now planning to run the mill with water power, which can be done about eight months in each year, and that will prove a big saving.

SOUTH DAKOTA.

BIG HORN MOUNTAINS.—The formation of the mountains is entirely different from that of the Black Hills, showing very little indications of the presence of gold or silver. Copper, however, abounds, though so far the ledges found are too narrow to pay for development, though some of the ore assays as high as forty-five per cent copper. At the Bald Mountain placer country, near Buffalo, which attracted so much attention last year, there is some gold, but not enough to pay: one company, with a $75,000 plant, is barely making expenses. The gold-bearing district is limited. Bald Mountain being a cement deposit, apparently formed before the upheaval of the surrounding mountains.

AT THE GOLDEN REWARD.—Deadwood *Pioneer:* Harris Franklin has gone to Chicago to purchase the requisite machinery for the 100-ton cyanide works which the company are going to build next to the Goldeu Reward chlorination plant.

At Puma the cyanide mill is running steadily on concentrates recovered by the Rice concentrator from Homestake tailings.

THE BLACK HILLS.—The owners of the Little American mine of Rainy Lake City got 27 ounces of free gold and a quantity of rich concentrates, the product of one and a half day's work with the stamp mill of the Little American. The free gold, alone valued at $499, came from 30 tons of ore. The Rainy Lake mill is now running night and day and the number of stamps will be douhled at once, and a new mill also put up. The vein on the Little American is 17 feet wide and widening.

UTAH.

Park District.

THE SILVER KING.—*Record:* About thirty men were laid off at the Silver King mine Saturday last and the work of enlarging the shaft to two compartments and a manway is now in full swing, and it is expected to have the same completed within 90 days. The shaft from the 700 level down is of the required size, hut from there up will have to he enlarged and retimbered. Surface water has ceased to trouhle and the work will he prosecuted without inconvenience from that source. The enlargement of the shaft, however, is not the only improvemeut to be made by the owners of that property, for it has heen determined to put in first-class machine shops, an air compressor and rock drills, and thus place the property on an equal footing with all the hig mines in the camp. The shops and the work of erecting the huilding has already commenced; will be equipped with a complete set of the latest improved tools, comprising a lathe, planer, drill press, patent forges, a 25-horse power engine and a duplex air compressor—in fact, everything necessary to enahle the company to do its own repairing, make needed improvements and facilitate rapid and economical work in all parts of the mine. When the improvements under way and in contemplation are completed the Silver King will he second to no other property in the camp, and the fact that last month, with a single compartment shaft and a depressed market, the property paid a dividend of 25

cents a share, or $37,500, shows that it is a big mine now, but it is going to get bigger as the years roll around, and with silver at $1 per ounce it would be a mighty lever in making the fame of Park City world wide.

A PECULIAR FEATURE.—S. L. *Tribune:* A number of Provo citizens have been to the Uintah country and located claims. There is one peculiar feature connected with the new district that is causing a great deal of comment, and the impression is prevalent among those best qualified to judge that before long something sensational will be made public. Of the very many samples brought in for assay, none have contained more than from $1 to $2, and in many cases not more than a trace, except those taken from the Dead Man claim, although apparently the same class of rock and taken from the same vein. The money to be paid Mr. Whittemore for his interest in the mines discovered by Hatch and Holladay has not yet been paid over, as was reported in a local paper some time ago.

BINGHAM DISTRICT.—The long Butterfield tunnel continues to be pushed ahead at an encouraging rate. It has thus far cut through four bodies of ore.

The new shaft on the West Mountain Placer Mining & Milling Company's property is down to water, and as the work cannot progress further without the aid of machinery, the men were laid off until the pumps, boilers, etc., arrive.

The Alice mine, which is being operated by Salt Lake parties, is attracting attention. A long tunnel is being run to tap the ore body. The tunnel starts on the Levant ground and runs through the J. C., Miners' Home, Alice No. 2 and Washington properties. Five hundred feet farther will have to be driven before the objective point is reached. The Alice is located on the same vein as the Highland Boy.

COLORADO.

San Juan District.

RICH ORE.—*Republican:* Samuel G. Beatty and M. Landa, of Silverton, came in yesterday with a carload of eight tons of ore from the Golden Fleece Mine and are at the Oxford.

The ore is of great richness and will probably average $2,500 to the ton. It will be sold to the Colorado Sampling Works.

"We folks in the San Juan District," said Mr. Beatty, "have just about gotten tired of waiting for an improvement in the market for silver, and have concluded to ship our ores to the best possible advantage. I am interested in a number of silver properties, also in mines which run heavily in galena ore, but gold is the only thing which it will pay us to mine now.

"The Golden Fleece mine is one of the richest in the district, and already shows signs of fine development. We have not done any stoping yet, but in the chute we have run, have discovered some remarkably rich ore. Samples have run as high as $79,000 to the ton, but of course these were exceptionally rich specimens.

"The mining men of the San Juan have about waked up from their condition of lassitude of the past few months and concluded that nothing could be gained by inactivity, notwithstanding the low price of silver. They are putting on new energy and going to work vigorously to develop their mines, satisfied that low profits are preferable to idle mines. They also realize that silver has nothing to hope for in the near future, and are seeking new mines of gold, copper, lead and iron, with all of which the district abounds."

ARIZONA.

ON THE AGUA FRIA.—*Courier:* Some months ago excitement was created by a lot of rich gold rock being brought in from the Moscow mining group, on the Agua Fria. The ore was free milling and when broken open the gold dropped from the honeycombs, covering the places where the rock was broken with glittering flakes of gold. At that time the owners were offered $100,000 for the mine, but, owing to some disagreement, nothing was done with the property then; since, work has been pushed and a large body of much richer ore struck. There are seven claims in the group. The owners will work the ore at a custom mill. This mill will be run by water power and the Moscow ore will be worked at a cost not to exceed $3.50 per ton.

WORKING DAY AND NIGHT.—*Journal-Miner:* The editor of the *Journal-Miner* visited the Lynx creek hydraulic works a few days since, and found the steam dredge and amalgamator working very satisfactorily to T. G. Barlow-Massicks, superintendent and general manager of the works. Mr. Massicks is running two shifts of ten hours each per day, and is putting through close on to 1,000 yards of gravel per day. The machine at work now differs very materially from the original machine sent out, in fact, but little of the original machine is left. The company which furnished it succeded in furnishing an excellent suggestion, by their machine, and Mr. Massicks has succeeded most admirably in working out the suggestion into a good practical machine for handling placer gravel and saving the gold in it, with a very small amount of water. The machine contains two principal features. First, the gravel is taken from the banks by means of a dredge, operated by steam; and the second is the amalgamating tank. The gravel is carried up in the dredge buckets and emptied into an immense steel cylinder, which constantly revolves, and which is provided with three sets of screens. As the gravel enters this, it is washed by means of water jets, and the washing process continues after it reaches the cylinder, and until it is discharged on an endless belt, provided with huckets similar, in principal, to an elevator, by which the debris is carried to one side, out of the way of the machine. The finer gravel and gold is carried to the large tank beneath the cylinder, where the gold is caught on plates. The whole thing is managed by five men, the machine being arranged so that everything is done by steam. It requires only three miner's inches of water to operate it, and this water, when used, flows back into the reservoir and is again pumped up into the machine, and is used again and again, the loss being comparatively small.

Red Rover District.

AN IMMENSE BODY OF ORE.—*Gazette:* Dr. G. W. Stimpson has returned from the Red Rover district, where he has had men at work on the Ruby mine. This is a property discovered years ago, but for its inaccessibility and distance from water the discoverers were unable to work it without the aid of capital.

The deposit is an immense iron dyke, in some places 400 feet in width, with croppings rich in gold, copper and silver. It is distant one and a quarter miles from the old Red Rover, which was without donht a chimney from this great mass of ore. The work of the past few weeks has resulted in a wide, roomy tunnel, 100 feet in length, and by driving 85 feet farther the ore body will bo cut 400 feet below the croppings.

NEW MEXICO.

SOLD FOR $75,000.—*Liberal:* P. H. McDermott of Carlisle has sold the Laura and Clara mines to the El Paso Smelting Co. for $75,000. There are three shafts on these properties, one fifty, one fifty-six and one a hundred and thirty-five feet deep. There are several hundred feet of drifts. No ore has been stoped. The ore runs nearly equal in value with gold and silver.

THE CONFIDENCE MINE.—Silver City *Enterprise:* In making the upraises to start the stopes the following results are shown: An average sample taken from upraise No. 1, ore body seven feet in width, gave 1.82 oz., $36.40, gold and 74.2 oz. silver, at 60 cents per oz. for silver $44.52, a total of $80.92 per ton. Another average sample from the samo upraise gave 1.20 oz., $24, gold and 81 oz., $48.60, silver; total $72.60 per ton. Upraise No. 2, ore body eight feet in width, gave 1.86 oz., $37.20, gold and 130.2 oz., $78.12, silver; total, $115.32. The lowest average obtained from these upraises during this work has been .75 oz., $15, gold and 50.7 oz., $30.42, silver, or a total of $45.42 gold and silver.

The mill is approaching completion as fast as men and means can accomplish it. The ore bins at the mill have about 700 tons in them and will soon he filled to their utmost capacity, about 1800 tons. At the mine upraises have been started at 900 and 1000 feet from month of tunnel, and stull timbers are being put in place to start stopes from. Two other upraises will also be started immediately, one at 400 feet from the month of the tunnel and one at 1100 feet. The whole of the ground along the entire length of tunnel will he blocked out for stoping as necessity for ore requires.

The mill and mine will be lighted by electricity. A telephone liue will be run from the mine to the mill. The poles for the telephone and electric light lines are heing strung along the route between the mine and mill. The pipe line trestle work is nearly completed, and the 7000 feet of five-inch pipe to supply the mill with water will soon he put in place. A larger pipe-line to carry water power to run the mill is contemplated; for the present the machinery will he run by steam.

NOTICE OF ASSESSMENT.

GOULD AND CURRY SILVER MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given that at a meeting of the board of directors, held on the 27th day of July, 1894, an assessment, No. 74, of fifteen (15) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 30th day of August, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 21st day of September, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the board of directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Philip Hayes in the Hayes & Steelman Mine near Gold Lake, Sierra Co., to deposit tailings on a flat in Mohawk Valley; from Stephen Soracco in the Mohawk Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in a ravine; from Frank F. Vanzlui in the William Tell Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in Yankee Ravine; from Nicola Rossi and Peter Lorenzo in the Grizzly Bear and Garfield Flat Mines near Johnsville, Plumas Co., to deposit tailings behind dams in Squirrel Creek; from Reagan and Lowe in the Howard Mine near Ono, Shasta Co., to deposit tailings behind brush dams in a ravine; from T. H. Steel in the Steel & Co's Mine near Brownsville, Yuba Co., to deposit tailings behind stone dam on New York Flat; and from the Consolidated Amador Volcano Hydraulic Gold Mining and Land Co. of California in the China Hill and Elephant claims, to deposit tailings in Sutter Creek; gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., on Monday, August 13th, 1894, at 1:30 P. M.

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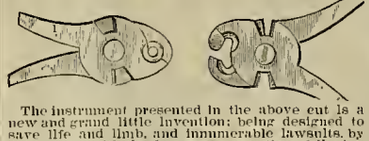

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Electrical Progress.

The Coming Electric Light.

A writer on the electric light says we are on the eve of a revolutiou in electrical science that seems destined to make of light not beauty's citadel merely, but the hestower of beauty itself. Without light heauty would cease to he evident. No wonder, then, that light has become the Nile of physics, with scientists seeking night and day for its ultimate source. The secret seems to have heen learned at last, and scieuce is now the land of the uusetting sun.

Imagine au ever-playing fountaiu of light or a century plant in uneudiug bloom, of which the petals are sheafs of light. There is no graceful dream too extravagaut iu this respect for realization now. The chaudelier, the globe, the bulb, the paiuful mechanism which has made the counection of light and machinery so unæsthetically obvious heretofore—all are destined to be swept away. Light iu the next century will well impalpably out of walls. It will stream from hrackets or picture frames, noue divining from wheuce it comes, like the perfumes of Lucullan hanquets.

Nicola Tesla predicts the results of the discovery that has beeu made. "The one impediment," he says, "is cost. That problem will he solved yet —perhaps in three mouths, perhaps not iu as many years. The existing waste in electric lightiug is barbarous—barharous. Ninety per cent of the material employed goes for nothing. But when we have settled the question of cost the uew era will dawn. Light will become really a great transforming factor in civilization. It will then he uot only day, but a glorious, heautiful day."

It may he mentioued at this point that to D. McFarlau Moore, the American electrician, who has done as much to popularize the use of electric light as any living man, probably, helongs the credit of having first called the attention of scieutists to the impeuding chauge. Tesla has indeed been experimeutiug for years, and long ago indicated the lines along which the trausformation would be wrought. Mr. Moore, however, demonstrated why the uear future will wituess the commercial adoption of the trausmissiou of light through tubes, aud that electricity is to be the ageut of this consummatiou. It is declared hy scientists that while the conversion of heat into power aud power again iuto the current kuown as electricity, seems to have reached a limit for the present at least, the matter of producing light from electricity has hardly hegun to be studied.

The incandescent lamp is admittedly the illuminant of to-day. In spite of its conceded advantages, however, the scientific world has come to look upon it as a crude contrivauce for reasons apart from the humiliating circumstance that to extract five per cent of light 95 per cent of the constituent elements goes to utter waste. Therefore, iu spite of the practical elimination of the factors of heat and odor from the prohlem of dispelling darkness, scientists have for years beeu at work in an endeavor uot so much to make new discoveries as to utilize discoveries already made.

Now, what is known as phosphorescent, or glow lighting, has come to be recognized as the source of untold millions to the capitalist who can first reduce it to a marketable commodity in the cities of the world. So far the great cost attending its utilization has stood in the way of any such enterprise. Mr. Moore makes the assertion, iu *Cassier's Magazine*, that electric sparks rapidly succeeding one another in a vacuum are the key to the whole treasure house. This fact is shown hy means of au ingenious contrivance now familiar to most electricians, in which the currcut of electricity is repeatedly broken hy rapid vibratious. The vibrations produce a correspondiug number of sparks which act upon the ether iu a bulb duly placed to be affected in precisely this manner, with the result that the whole bulh gives forth light. Such electriciaus as Nicola Tesla and McFarland Moore would not put the condition of things into such simple words, Mr. Moore indeed sayiug, and very scientifically, no douht, that the whole thing is the result of the current heing rapidly disrupted by a magnetic field exterior to the evacuated space.

In fact, the whole problem of light may be said to have become one of vihrations. Its solution, as stated, has heen arrived at hy means of electric sparks thus made to succeed one another rapidly in a vacuum. And aloug these lines has it become a possibility to conduct light through tuhes, with results destined to effect the revolution now on the eve of accomplishment.

"Then we will, iudeed, have beautiful light," says Nicola Tesla. "How few of us realize the importance of the cost of light on the lives of people today. It is not too much to say that when the coming changes are inaugurated our whole municipal life will be trausformed. Light will he not merely a meaus of seeiug at night. It will become the great source of beauty in streets aud homes. Heretofore the difficulty of getting both light and heauty has seemed insuperable. We now have the means of produciug light that will uot merely be beautiful itself, but will make all thiugs beautiful."

"And how soon may we look for all this?"

"As soou as the matter of cost has been reduced within due limits. It will undouhtedly be reduced in time. He would be a rash electriciau who ventured to say precisely when. It may be some years. Perhaps a genius will hit upon the true method to-morrow. At all events, electric light cannot fail to be ultimately one of the cheapest of commodities."

Mr. Tesla concedes that existing electric light fixtures are too unpleasantly evident. In the coming condition of things they will he eliminated so far as being visihle is concerned, unless some special effect were sought. In a great hall, for instance, the light would stream from the capitals of its pillars, or it could he as easily arranged to shed itself from the ceiling or the dome cornices. The illustrations herewith will give an idea of the effects Mr. Tesla had in mind. Separate lights, such as we have now, will become things of the past.

"The transformation iu street illumiuation will be very marked," he declares. "The unsightly pole will no louger he seen. Light may stream from a statue or from a fountain in great waves. Its source will be hidden. Its very quality will be chauged. The glare now so ungrateful to many eyes will give way to a sympathetic glow."

The young electrician was of the opiuion that the popular mind and taste were not sufficiently educated on the subject of electric lighting.

"The most wretched makeshifts are tolerated," he says, "because the puhlic have not as yet beeu accustomed to the best results. There was at one time, indeed, a prejudice against electricity itself as a means of lighting, owing to its depressing effect on some people. To-day the improvements are so marked that the light is preferred to gas. In the same way the improvements to come will be so great that the unsightliness of present methods will be deemed unendurable. It is hardly too much to say that the heautifying of cities will never he adequately undertaken until the electric light has been improved, or rather, reudered generally available in its new form. Then we may look for decided alteratious in the appearance of the streets of our great cities.

A striking improvement, moreover, will he the absence of sharply defined shadows that detract so much from the advantages of the present lights. We will have not lights but light, as Mr. Moore so graphically puts it. Phosphorescent electric light so closely resemhles the light of day that the coming era will practically be one of unbroken day.

The elimiuatiou of elaborate fixtures in great edifices will he a very conspicuous cousequence of the reform. In spite of the artistic nature of the candelabra which have been introduced into the more preteutious structures, they are a serious drawback to the stateliness of some forms of Gothic and Greek architecture, and, as architects well kuow, it is frequently necessary to modify an interior on this account. But nothing can he conceived more majestic than the iuterior effects which will become possible by the introduction of the new method. No glohes, no hrackets, no candelabra, can break the sweep of pillar or nave. There will be greater cleanliness, as well as beauty, aud an immeuse saving of time aud trouble, not to speak of expense.

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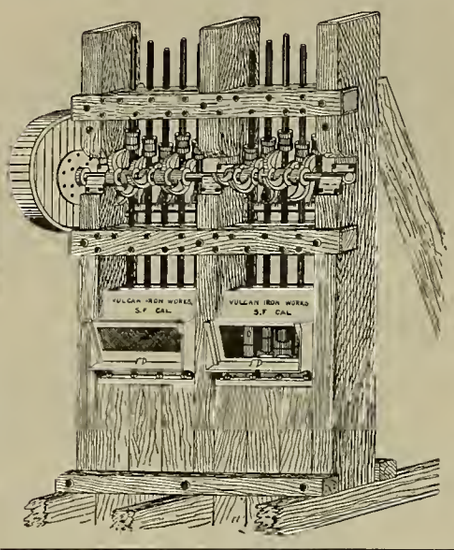

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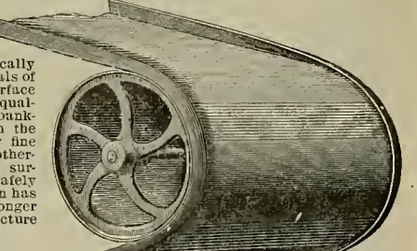

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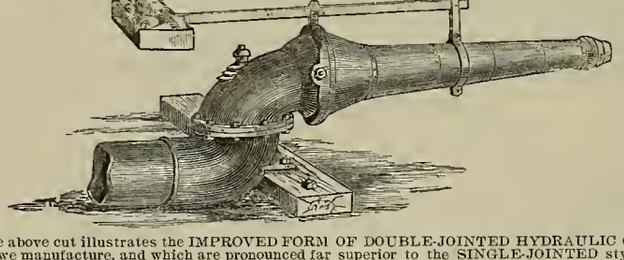

The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.
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Practical Information.

American Lumber Abroad.

A publication from the State Department consists of reports from American consuls throughout the world regarding United States lumber in foreign markets. While intended primarily for the advantage of American lumber producers and shippers, the information is of unusual general interest. The remarkable fact is shown that the United States sends lumber to every country on the globe, and that while in many lands the market is virtually controlled by the shippers of this country, there are still greater possibilities of increased sales.

Nearly all the building lumber imported by Africa, it is said, comes from the United States; that Japan buys it, and that no other lumber enters South American ports. In Samoa 4c a foot is paid for rough Oregon pine and California redwood. Hawaii, by letting American lumber in free of duty and charging 10 per cent ad valorem duty on Canadian lumber, virtually prohibits the importation of the latter. Consul Mills, at Honolulu, reports that all the timber used there comes from the United States, and that it amounts to 15,000,000 feet annually. Even the island of New Caledouia prefers pine from Washington, and pays about $20 for 53 cubic feet. All the lumber used in Madeira comes from Maine, North Carolina and Nova Scotia, while Mexico and the West Indies rely wholly upon the United States. Australia buys $1,000,000 worth every year, and would take as much more if it could be bought readily.

The great difficulty appears to be in procuring the transport of American wood. Little is carried by American ships. The principal rivals of this country in the world's lumber trade are Canada and Norway, except in England, where Russia and Germany are competitors, and in Austria, which is supplied by countries on the Mediterraneau. Austria, however, gets her staves from the United States, as do most of the other nations of Europe. More lumber from the United States than from Canada is used in Great Britain. Nearly all the spools are made of white birch from Maine. Even Oregon timber reaches England.

One consul protests against selling American lumber in foreign countries because it may ruin the forests of the United States. It appears from most of the consular reports that comparatively few countries have wooden houses, on account of the great expense of lumber, and that transportation facilities alone prevent the substitution of wood for stone and similar materials. This is generally the case in tropical countries, where the woods are too hard to be profitably used for ordinary construction.

From a business point of view it is shown that the American export lumber trade is still in its infancy, though American timber is probably more widely known than any other product of this country.

Aluminum does not appear likely to replace steel in the making of medical instruments. A physician who has tried it says the aluminum probes, sounds, tongue depressors, etc., do not oxidize, but he finds they are deficient in elasticity and stay after pressure. Moreover, he adds, the aluminum is so light that it makes him feel as if he could put no trust in it; he likes, when he uses an instrument, to feel that he has got hold of something.

The latest number of the *Bulletin* of the American Geographical Society announces that the recent study of the observations on mountain summits in the neighborhood of Mount St. Elias shows that Mount Logan is the loftiest peak in North America, with a height of 19,500 feet, thus being 1200 feet higher than Orizaba and 1500 feet higher than Mount St. Elias.

Burial at sea will, for some people, lose half its terrors if, as the investigations of Captain Maury lead us to believe, it is true that at certain depths decay is practically arrested and all the corpses which have been committed to the deep in blue waters, with weights attached, are now standing on the bottom with lineaments and features as perfect as they were on the day whereon their comrades cast them over the ship's side.

One of the latest trials of the profit-sharing system has been undertaken at Westfield, Mass., by the Foster Machine Company. Each employe is supposed to be a stockholder to the extent of $600 or more, and at the end of the year he receives a dividend thereon at the same rate as the paid-up stockholders. If this is ten per cent he gets $60 or more. Meanwhile, he receives his regular wages.

The telephone business has developed an interesting fact that may check the growing popularity of aluminum. That metal has recently been used in telephone diaphragms, and there are signs that it corrodes under the action of the human breath. It is argued that if such corrosion results from that agency, the metal may be injuriously affected by vegetable acids.

Lieutenant F. Boyer, of the French navy, to avoid collisions, proposes to introduce at the top on all fast sailing steamers an electric light, which will cast a beam ahead to indicate the direction in which the vessel is steering. So long as the approaching ship was not in the actual pencil of light it would be unnecessary for her to alter her course.

The latest thing out is a pulseometer, by which the life insurance examiners can tell to a fraction the exact condition of an applicant's heart beat. An electric pen traces on prepared paper the ongoings, haltings and precise peregrinations of the blood, showing with the fidelity of science the strength or weakness of the tell-tale pulse.

Touch the convex side of a watch glass upon water so as to leave a drop hanging on the glass. Pour a little ether into the concave side and blow upon it. The rapid evaporation of the ether will render the glass so cold that the drop of water will be frozen.

The Mechanical Engineering Department of the Washington Agricultural College and School of Science, Pullman, Wash., now occupies its new $10,000 building.

One of the biggest projects now before the engineering world is the construction of a storage reservoir in the Nile above Egypt.

No. 6.

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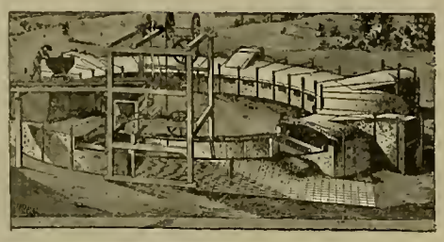

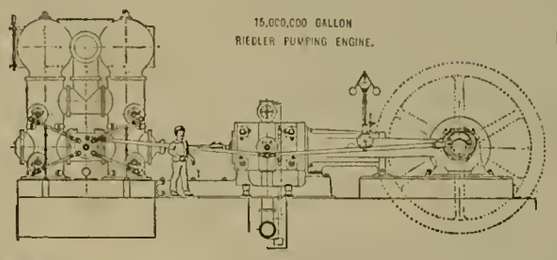

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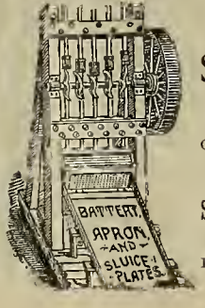

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Market Reports.

The Markets.

SAN FRANCISCO, Aug. 2, 1894.

The slight fluctuations of the week in silver leave the price the same. As compared with '93, the seven months of '94 show a depreciation. The highest price reached in London in '93 for an ounce of British standard silver (.925 fine) was in January—38 9-16d., equivalent to $0.84724 per fine ounce, and the lowest 30½d. for British standard, or $0.66426 per ounce for fine silver. The highest average London price for any one month in the year was 38.356d in February, and the lowest 32.015d., the average price in December. The highest monthly average price of fine bar silver in New York was $0.84380 in February, and the lowest $0.70250 in December. The difference between the highest and lowest monthly average price was greater than in any year since 1880, amounting to 16.7 per cent. The average London price for the whole year of bar silver, .925 fine, was 35.596d., and the average price during the year of fine bar silver in New York was $0.78219, a decline as compared with the average price in 1892 of over 10.5 per cent.

The following table shows in the first column the average London price per standard ounce, .925 fine, in pence; in the second column the equivalent in New York of the London price per fine ounce, the rate of exchange being also considered, and the third column the actual selling price per fine ounce in New York. The averages are for the month:

	Average Prices—		
1893.	London. Standard Ounce.	New York. Equivalent. Fine Ounce.	New York. Price, Fine Ounce.
January	38.321d	$0.8217	$0.84115
February	38.356	0.84316	0.84380
March	38.108	0.83255	0.83713
April	38.028	0.83610	0.83735
May	38.069	0.83856	0.84081
June	37.279	0.81654	0.81802
July	33.060	0.71981	0.72333
August	33.944	0.74337	0.74851
September	34.120	0.74709	0.75210
October	33.608	0.73339	0.73711
November	32.240	0.70390	0.70947
December	32.015	0.70177	0.70250
Year	35.596d	$0.77986	$0.78219

The greatest range of London prices in any month was in June, when quotations fell from 38¾d to 30½d. the closing price in December showed a slight reaction from the fall which followed the closing of the Indiau mints, but it was only a slight one.

So far in '94 the averages for the months are as follows:

1894—	London. Standard ounce.	New York. Fine ounce.
January	31⅛	67⅝
February	29⅛	63¾
March	27⅜	59¾
April	28¾	62¾
May	28⅛	62½
June	28⅝	62⅝
July	28¾	62⅝

In copper the future is as uncertain. Like silver, it is absorbed in India, where it is almost entirely used for religious purposes, except where the worshiper is so rich he can afford silver. All the requisites for Hindu worship—the shrines of the gods, the platter with its floral patterns, the pedestal on which the idol is placed during the sacred bath, the vessels for holy water—all these in a Hindu temple are of copper.

Regarding the future of the red metal, it is believed the preseut low price cannot in the nature of things be permanent. This belief is shared by W. T. Sargant & Sons, who, in their latest circular to hand, say:

The statistical position of copper is one of unusual interest. It is just twelve months ago that the disturbed state of American trade showed itself distinctly in the utter inability of the United States to consume the metal at anything like the old rate; and from July 1 to December 31, 1893, it supplied Europe with 57,425 tons of copper, against 16,901 in the same time in 1892. During the six months, say from January 1 to June 30, 1894, it has further supplied 37,394 tons, against 19,989 tons in the same months of 1893. This increase of 57,950 tons in twelve months has been followed by an increase in our visible supplies of 117 tons. In other words, Europe would have been starved out had this surplus not been received. Sball we receive a similar surplus in the twelve months now ensuing? At present the probabilities are greatly against it. There is not the same pressure to sell on American account in Europe, and the reports point to a moderate and steady revival of demand in America. The producers there, seeing how entirly they hold the key of the situation, might determine to lessen the output, which is at present going on at the fullest possible rate. The present situation seems, then, to indicate that with the continuance of a large production aud a small consumption in America the surplus will not add to our visible supplies in Europe, but that we are liable to the double contingency of a larger consumption and smaller production in America that would force the demand heavily on to the European reserves. What justification, therefore, is there for copper remainiug at the present level of intense depression? Our price to-day is £10 per ton below the average of the past ten years, whereas we have facing us eventualities that might amply justify prices £10 per ton above such an average. We never remember a position so clearly justifying holders in nursing their stocks in expectation of a demaud from consumers to clear them out of it at higher rates.

The lead market is as heavy as the avoirdupois of the metal itself.

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¼
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2½
Norway, base	—	@	4½
PIG IRON.		Spot.	
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	—	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	—	@	— —
Clay Lane White	22 50	@	— —
Langloan	22 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	22 50	@	— —
Cargofleet	—	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, "			2 10
Buck, Balls and Chilled, do, "			2 10
QUICKSILVER.			
Home trade, per flask	35 75	@	36 00
STEEL.			
English, lb	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½@		15
Pick and hammer	6½@		10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lb	23	@	23½
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			6 00
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			7 75
Brymbo			7 25
West Hartley			7 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 50	@	— —
Cardiff	7 50	@	— —
Lehigh Lump	17 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	9 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in hulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

New York Prices.

NEW YORK, Aug. 2.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.	Tin.
Thursday	28¾	62½	....	....	....
Friday	28⅝	62⅝	9 00	3 10	19 40
Saturday	28¾	62¾	9 20	3 10	....
Monday	28¾	62¾	....	....	....
Tuesday	28⅞	62¾	9 20	3 10	19 25
Wednesday	28¾	62¾	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by leuder	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers', 60 days	$4.87¾
London Merchants	$4.86¾
London Sight Bankers'	$4.89½
Refined Silver, per ounce	62¾
Mexican Dollars, nominal	51½@51¾

Mining Share Market.

SAN FRANCISCO, August 2, '94.

A little stir in Gold Hill shares was the only feature of a dull week. The shorts seem to have gone out of business on Pine Street, there being nothiug of present encouragement in prices. The assessments of the first seven months of '94 have been light, comparatively, the companies generally being in good trim financially. The stock business simply trains with all other lines, and till there is a general move, there will be little of import.

The Savage will try what virtue there is in having 800 tons of low-grade ore concentrated.

The Morgan mill resumed last Wednesday on 1000 tons ore from the Con. Cal. & Virginia. Work is also resumed in the Belcher, Yellow Jacket, Crown Point and other Gold Hill mines.

Miller, Sloss & Scott have sued the Integral Quicksilver Mining Company for $31,325 goods alleged to be sold and delivered.

Dividends in July.

Local incorporations declared July dividends as follows:

Name—	Rate.	Amount.
†American Bank & T. Co	3 per cent	$12,804
*Bank of California	$8 ₱ share	90,000
†California S. D. & T. Co	1 50 ₱ share	30,000
†Crocker-Woolworth Bank	4 per cent	40,000
*First National Bank	5 per cent	75,000
*Nevada Bank	1½ per cent	45,000
*Sather Banking Co	1½ per cent	15,000
†Wells, Fargo & Co.'s Bank	3 per cent	187,500
*Fireman's Fund Ins. Co	3 per cent	30,000
*Pacific Surety Co	2 per cent	2,000
Cal. Electric Light	15c ₱ share	7,500
Edison L. & P. Co	8 per cent	10,666
Oakland Gas Co	20c ₱ share	6,000
Pac. Gas Improvement Co	50c ₱ share	15,000
S. F. Gas Light Co	35c ₱ share	35,000
Contra Costa Water Co	50c ₱ share	15,000
Spring Valley Water Co	50c ₱ share	58,800
*Marin County Water	75c ₱ share	4,500
Atlantic Dynamite Co	40c ₱ share	12,000
California Powder Co	50c ₱ share	7,500
California St. Cable	50c ₱ share	5,000
Geary St. R. R. Co	50c ₱ share	5,000
Metropolitan Ry. Co	10c ₱ share	1,000
Alaska Packers' Ass'n	75c ₱ share	37,500
Pacific Telephone	40c ₱ share	13,200
Sunset Telephone	25c ₱ share	7,500
Alaska-Treadwell M. Co	37½c share	75,000
Homestake Mining Co	15c ₱ share	18,750
Omaha Mining Co	15c ₱ share	3,600
Standard Con. M. Co	10c ₱ share	10,000
Total		$875,520

*Quarterly. †Semi-annual.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied.*	*Delinq't and Sale.*	*Secretary.*
Gould & Curry S M Co, Nev	74	15c	July 27,	Aug 30, Sept 21.	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17,	Aug 24, Sept 21.	C C Harvey, 309 Montgomery
Mexican G & S M Co, Nev	50	25c	June 12,	July 26, Aug 15	C E Elliott, 79 Nevada Block
Occideutal Con M Co, Nev	16	10c	May 31,	July 23, Aug 14	A K Durbrow, 69 Nevada Block
Osborn Hill G M Co, Cal	3	15c	July 7,	Aug 7, Aug 28	R R Graysou, 331 Pine
Overman S M Co, Nev	71	10c	July 17,	Aug 21, Sept 11	G D Edwards, 414 California
Potosi M Co, Nev	42	25c	Aug 2,	Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24,	Aug 24, Sept 20	W J Guruett, 308 Piue
Seg Belcher & Mides M Co, Nev	14	10c	June 12,	July 16, Aug 6	E B Holmes, 309 Moutgomery
Sierra Nevada M Co, Nev	107	25c	July 18,	Aug 22, Sept 11	E L Parker, 309 Montgomery
Savage M Co, Nev	84	20c	July 27,	Aug 30, Sept 19	E B Holmes, 309 Montgomery
Union Cons M Co, Nev	49	15c	June 20,	July 25, Aug 15	C C Harvey, 309 Moutgomery

MEETINGS.

Company and Location.	*Meeting.*	*Secretary and Office in S. F.*	*Date.*
Altoona Q S M Co, Cal	Special	C Allenberg, 630 Brannan	Aug 16
Alta S M Co, Nev	Annual	J E Jacobus, 309 Moutgomery	Aug 16
Derbec G M Co, Cal	Annual	B E Auger, 330 Sansome	Aug 7
Jack Rabbitt M Co, Nev	Annual	J F Holling, 30 Post	Aug 13
Navajo S M Co, Nev	Annual	J W Pew, 310 Pine	Aug 14
N W C M Co, Cal	Special	F A Hassey, 314 Montgomery	Aug 16
Sunrise G M Co, Cal	Annual	E F Baxter, 106½ Third	Aug 8

The aggregates for July '93 and '94 compare as follows:

	1893.	1894.
Banks	$567,500	$495,304
Gas Companies	73,500	74,166
Water Companies	74,500	78,000
Insurance Companies	41,000	32,000
Powder Companies	12,000	19,500
Street R. R. Companies	10,000	11,000
Mining Companies	67,700	107,350
Miscellaneous Companies	1,200	58,200
Totals	$847,400	$875,520

The local savings banks paid out last month about $2,000,000 semi-annual interest on deposits.

The Marysville *Democrat* and Sutter *Independent* are having a lively discussion as to the object of the building of the dam at Deguerre Point, this side of Smartsville. The *Democrat* contends it is for tbe purpose of restraining the debris in the tributaries of the Yuba, and thereby improve the future navigation of the river. The *Independent*, on the other hand, conteuds that the building of the dam is in the interest of future hydraulic mining. The *Independent* is correct iu its assumption, says the Nevada *Transcript*. That dam is to be built so as to enable hydraulic mining to be resumed all along the ridge in Nevada county, where it has beeu estimated that there are not less than two hundred millions of gold which cannot be taken out in any other way than by hydraulickiug. Just as soon as that $300,000 dam is built permits will be granted to resume hydraulic mining, and then the tons of gold which will be taken out will make times in California livelier than they have been witnessed in thirty years. The resumption of hydraulickiug on the ridge means the employment of a thousand or more men, au increase of several millions to the taxable property of the county, besides relieving the stringency of the money market throughout the world. The gold that is now locked up is needed very badly, and it must be taken out.

The Morning Star mine at Iowa Hill has declared a $4 dividend.

The following illustrates the changes of the week:

Mines.	26	2
Utah	6	..
Sierra Nevada	50	$ 82
Union	59	70
Mexican	93	1 20
Ophir	1 90	2 25
Consolidated California and Virginia	3 25	4 00
Best & Belcher	1 05	1 30
Gould & Curry	48	60
Savage	26	36
Hale & Norcross	58	73
Chollar	25	37
Potosi	46	50
Bullion	18	21
Exchequer	..	..
Alpha	..	12
Confidence	..	1 10
Yellow Jacket	43	48
Crown Point	70	80
Belcher	72	92
Overman	10	15
Justice	15	..
Alta Consolidated	20	..
Consolidated New York	..	..
Challenge	34	45
Bodie	95	1 15
Andes	..	48

San Francisco Stock Board Sales.

SAN FRANCISCO, Aug. 2, 1894.

FIRST SESSION—9:30 A. M.

300 Alpha	12	500 Mexican	1 20
100 Andes	48	350	1 15
250	47	200 Occidental	10
200 Belcher	92	600 Ophir	2 25
200	90	200	2 20
100 Bodie	1 15	250 Potosi	50
900 Best & Belcher	1 30	450 Overman	15
50 Challenge	45	200	14
300 Chollar	37	200 Savage	36
300 Crown Point	80	200 Seg Belcher	14
550	78	100 Sierra Nevada	82
100 Gould & Curry	60	300	81
100 C. C. & Va	4 00	200	80
1550	3 90	300	79
300	3 95	200	78
50	3 85	400 Union	70
400 Hale & Norcross	73	100	68
100 Kentuck	14		

SECOND SESSION—2:30 P. M.

100 Andes	47	100	70
300 Belcher	84	100 G & C	54
400 Best & Belcher	1 15	100	52
300 Bodie	1 10	300 Mexican	1 05
100 Bullion	20	550 Ophir	2 15
100	21	50 Overman	11
150	19	200 Potosi	45
100 Challenge	38	700	43
400 Chollar	30	100	44
50 Confidence	1 10	100 Sierra Nevada	74
300 Con Cal & Va	3 75	100	73
400	3 80	150 Union	67
250 Crown Point	73	100	66
400	71	100 Yellow Jacket	48

THE principal minerals found in the aerolite that recently fell in North Dakota were gold, silver, nickel and cobalt.

Professional Cards.

WM. GILBERT, B. S., Manager.
PRACTICAL ENGINEERING SCHOOL,
205 Goodnough B'ld'g, Portland, Or.
Civil, Electrical, Steam, Mining, Assaying. Full charge of plant taught. Circular.

F. ORTON, Mechanical Engineer.
EXPERT DESIGNER of Special and General Machinery.
PREPARING PLANS of Steam, Air and Hydraulic Apparatus; Iron and Wood-Cutting Machines; Transmission of Power, Etc.
218 Mission St., San Francisco.

The Evans Assay Office.
W. N. JEHU, - - - - Proprietor.
Successor to Jehu & Ogden.
628 Montgomery Street, San Francisco.
Rooms 46 and 47 Montgomery Block.
Ore Assays, Analyses of Minerals, Metals and their Alloys, Etc.
LESSONS GIVEN IN ASSAYING.

School of Practical, Civil, Mechanical,
Electrical and Mining Engineering.
Surveying, Architecture, Drawing and Assaying.
728 Market St., San Francisco, Cal.
OPEN ALL YEAR.
A. VAN DER NAILLEN, President.
Assaying of Ores, $25; Bullion and Chlorination Assay, $25; Blowpipe Assay, $10. Full Course of Assaying, $50. Established 1864.
☞ Send for Circular.

Nevada Metallurgical Works,
No. 23 Stevenson Street,
Near First and Market Sts., San Francisco.
C. A. LUCKHARDT, Manager.
Established 1869.
ORES WORKED BY ANY PROCESS.
Ores Sampled.
ASSAYING IN ALL ITS BRANCHES.
Assays of Ores, Minerals, Waters, Etc.
WORKING TESTS (PRACTICAL) MADE.
PLANS AND SPECIFICATIONS furnished for the most suitable process for working ores.
SPECIAL ATTENTION paid to examinations of mines; plans and reports furnished.
C. A. Luckhardt & Co.,
(Formerly Huhn & Luckhardt),
Mining Engineers and Metallurgists.

Everette's Mining Office.
(Pioneer Mining Geologist's Office of the Pacific Northwest.)
MINING LAW, MINE EXAMINATIONS, METALLURGY, ASSAYING AND ANALYSIS.
"Consulting Associate Mining Attorney at Law."
Will examine and report upon "Title and Exact Value" of Gold, Silver, Lead, Copper, Coal, Iron, Clay or other Mineral Properties IN ANY PART OF THE WORLD. Any information mining men may desire to know, relative to the MINERAL or COAL resources of the entire Pacific Northwest, will be honestly given.
Dr. Willis E. Everette,
1318 E Street,
Tacoma, State of Washington, U. S. A.

Almarin B. Paul, M. E.,
Mining Operator,
ROOM 5, CROCKER BUILDING.
Cor. Market and Montgomery Sts., San Francisco.
OFFICE OF
California and Nevada G. & S. Extraction Co.
Shasta Gold Extraction Company.
Comstock G. & S. Recovering Co.
Agency for the CYANIDE PROCESS
For the Counties of Shasta, Trinity, Siskiyou, Inyo and Mono, California; Esmeralda, Story, Lyon and Douglass, Nevada.
Plans and Estimates made for IMPROVED CYANIDE PROCESS PLANTS for Gold and Silver Extraction, and competent instruction for successfully working the same on a large, practical scale.

PATENTS
DEWEY & CO.,
220 Market St., S. F.

Oldest Mathematical Book.

The oldest mathematical book in the world, which dates some 4000 years back, and was written in Egypt, contains a rule for squaring a circle. The rule given is to shorten the diameter by a ninth, and on the line so obtained to construct a square; and this, though far from being exact, is near enough for most practical purposes. Since then the amateur squarer of the circle has been a thorn in the side of the professional mathematician. Learned societies at last, in pure self-defense, made a rule that all solutions of the problems sent to them should, without examination, be consigned to the flames. In the last century a Frenchman named Mathulus was so sure that he had succeeded in squaring the circle that he offered a reward of $1000 to any one who proved his solution erroneous. It was shown to be erroneous, if not to his own satisfaction, at least to that of the courts, and he had to pay the money. Mathematicians have long been convinced that the solution was impossible; but it is only a few years since they were able to demonstrate this.—Engineers' Gazette.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JULY 24, 1894.

523,473.—SASH BALANCE—L. Huntington, Tahoe, Cal.

523,440.—LIFTING MACHINE—D. Nelson, Reno, Nev.

523,309.—GAS ENGINE IGNITER—A. J. Painter, Pasadena, Cal.

523,389.—FINGER GUARD—A. T. Snell, Santa Barbara, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

JOINT AND BEARING.—Weldon C. Rarig, San Francisco. No. 523,238. Dated July 17, 1894. The object of this invention is to provide an improved means for securing removable bushings which are employed to form the wearing faces of a joint. It consists of one or more elastic sleeves open along one side and adapted to fit upon the pin which forms one part of the joint, and within the eye or box within which the pin enters. The elasticity of the inner one contracts it upon the pin and the outer one expands within the box. Projections upon one part and corresponding depressions upon the other lock the sleeves to their respective parts when required, while thin contact faces receive the wear. This allows the sleeves to be easily removed and replaced at a trifling expense, and the more important parts are preserved from wear.

SASH BALANCE.—Louis Huntington, Tahoe, Cal. No. 523,473. Dated July 24, 1894. This invention relates to an improvement in devices for opening and closing windows without the use of weights or springs. It consists in the combination of a sliding sash with a horizontal revolvable shaft which carries one or more pinion wheels, the teeth of which mesh with corresponding teeth in vertical racks projecting from and secured to the sash. A flanged guide wheel is situated near the pinion wheel so that the rack passes between this guide wheel and pinion wheel, and is thereby kept in engagement with the pinion. A means, consisting of a band or cord passing around the wheel upon the shaft, is employed for rotating the same and raising or lowering the sash.

Again in the Lead.

It is rare that an award is so meritoriously bestowed as that which gave to George E. Woodbury of this city the first premium at the Midwinter Fair on his concentrator. The Woodbury Concentrator has successfully stood the test in numerous competitive exhibitions and in practical working alongside of other machines. It took the first premium at the last two fairs of the Mechanics' Institute, the first premium at the State Fair in 1892, a similar award at the Columbian Exposition at Chicago, and it has now captured the first prize at the Midwinter Exposition.—*S. F. Report.* *

Do You Own a Mine?

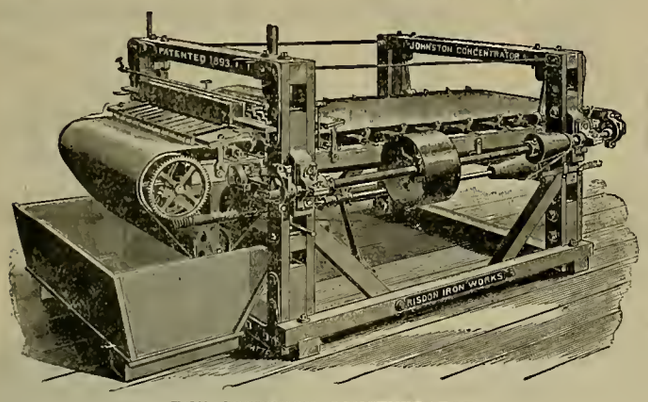
If so, you are interested in concentration, a process which requires no description, and the machinery used is pretty generally known. It can be safely stated without going into a description of several new concentrators, which, like the pulverizers that come out to displace the stamps, are heard of for a little while and then drop out of sight again—that where sulphurets are of such value as to make close saving necessary, the Frue Vanner, or Concentrator, is always used. In all competition of concentrators the Frue Vanner is taken as the standard machine of the world, and all comparisons made by it. There have been over 4000 of these machines sold. They are in use in every part of the world where mining is carried on, including Africa, Australia, New Zealand, India, Siberia, South America, China and Japan, and a great many of the smaller provinces. There have been sold on the Pacific coast alone over 1600 of these Vanners, and in all cases they are giving entire satisfaction.

From time to time valuable and important improvements have been made in this machine, the most notable being the Brownell patent flange for the rubber belt, which does away with nearly all the strain and cracking, as in the old style of flange, making the life of a belt more than double that of other style belts in the market. The lip of flange bends outward in going over the large end rolls, thereby distributing the strain in the solid rubber, and bringing virtually no strain, either at the edge or at the base of flange, as is the case in all belts with a raised edge.

Illustrated catalogue of this concentrator will be furnished upon application to James S. Brownell, Western Agent Frue Vanning Machine Co., 132 Market street, San Francisco, Cal. *

The Johnston Concentrator.

SIMPLICITY OF CONSTRUCTION. ✦✦ GREAT DURABILITY. ✦✦ EASE OF OPERATION. ✦✦ INCREASED PERCENTAGE OF SULPHURETS SAVED.



THE JOHNSTON CONCENTRATOR.

THE HUDSON GOLD MINING CO., WARD, COLORADO, June 8, 1894.

RISDON IRON WORKS, San Francisco—GENTLEMEN:—After a thorough test of the Johnston Concentrator, I am so well satisfied that I wired you to ship me two more as speedily as possible. I find the machine well constructed, easily kept in order, requiring but little attention, and doing entirely satisfactory work on our ore. After my experience with other tables, I am congratulating myself on my possession of the Johnston. Yours faithfully,

B. LANGRIDGE, Ph. D., Mining Engineer.

(COPY.) SAN FRANCISCO, CAL., June 1, 1894.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco:

GENTLEMEN:—We have tested the Johnston Concentrator furnished us by you on trial; and after an exhaustive test, we are satisfied it is the best in the market. Please prepare and ship us, as soon as possible, THIRTEEN more machines.

Yours truly, APOLLO CONS. MINING CO.
[Signed.] By LEON SLOSS.

—MANUFACTURED BY—

THE RISDON IRON WORKS,

—OFFICE AND WORKS—

Cor. Beale and Howard Streets, = = = San Francisco, Cal.

..... BUILDERS OF IMPROVED .....

Mining, Milling, Pumping and Hoisting Plants.

CATALOGUES AND PRICES FURNISHED UPON APPLICATION.

UNION IRON WORKS,

CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

—MANUFACTURERS OF—

MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chili Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

SHIP BUILDERS. ★ BUILDERS OF U. S. WAR SHIPS. ★ HYDRAULIC LIFT DOCK.

NEW YORK OFFICE: 145 BROADWAY. CABLE ADDRESS: "UNION."

THE ✪ PELTON ✪ WATER ✪ WHEEL!

—EMBRACING IN ITS VARIATIONS OF CONSTRUCTION AND APPLICATION—

THE PELTON SYSTEM OF POWER.

The most simple and efficient water power appliance for mining, electric or other service. Full and reliable information given regarding any proposed application upon receipt of the necessary data.

The Pelton Water Wheel Co., 121 Main St., San Francisco, Cal.

THE GATES ORE AND ROCK CRUSHER!

SUPERIOR TO ALL OTHERS FOR EITHER MINING OR ROAD WORK. SEND FOR CIRCULAR.

THE PELTON WATER WHEEL CO. . . 121 Main St., San Francisco, Cal. . . General Western Agents.

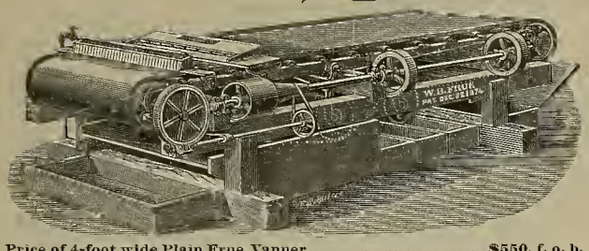
MINE BELL SIGNALS

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN LEGAL SIZE, 12 X 36 INCHES, THE MINE BELL SIGNALS AND RULES PROVIDED FOR IN the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We can furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market Street, San Francisco, Cal.

FRUE ORE CONCENTRATOR.

OVER 4000 IN ACTUAL USE.

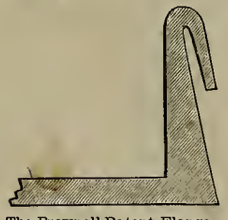


Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

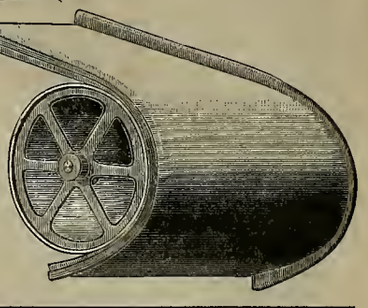
—o—

For any information, pamphlets, circulars or testimonials, call on or address

Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.



The Brownell Patent Flange.



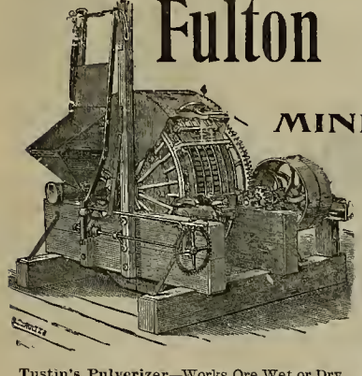
Price of 4-foot wide Plain Frue Vanner		$550, f. o. b.
" " "	Improved Belt Frue Vanner	700, f. o. b.
" 6-foot "	Plain Belt Frue Vanner	700, f. o. b.

HAVE YOU A MINE? If so do not fail to see Parke & Lacy Co.'s Stock of MINING MACHINERY

SOLD AT LOW PRICES.

21 and 23 Fremont Street, - - - - - - San Francisco, Cal.

Fulton Engineering and Ship-Building Works.



Successors to FULTON IRON WORKS (Hinckley, Spiers & Hayes), and F. A. HUNTINGTON.
Office and Branch Works, 213 First Street; Main Works, Harbor View, San Francisco, Cal

MINING AND MILLING MACHINERY.

Adapted to every description of Mining and Milling.

Manufacturers of the TUSTIN PULVERIZER; adapted to Wet or Dry Crushing,

Also the well-known HUNTINGTON CENTRIFUGAL ROLLER QUARTZ MILL.

Special Descriptive Circulars of these Mills sent on application.

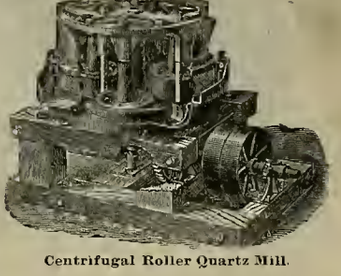
Specialties manufactured by us—"HUNTINGTON" BLAKE ROCK BREAKER; "FULTON" BLAKE ROCK BREAKER; FRUE VANNERS; "BOSS" CONTINUOUS SYSTEM.

Manufacturers of all kinds of ELECTRIC LIGHT AND ELECTRIC R. R. AND CABLE R. R. PLANTS. STEAM ENGINES—Plain Slide Valve, Corliss High Pressure, Corliss Compound Condensing and Non-Condensing.

Agents and manufacturers of the DE LA VERGNE REFRIGERATING MACHINES, FILTERS OF THE NEW YORK FILTER COMPANY.

Sole Agents for THE DEANE STEAM PUMP, ARMINGTON & SIMS ENGINES, LEFFEL WATER WHEELS.

Tustin's Pulverizer—Works Ore Wet or Dry.



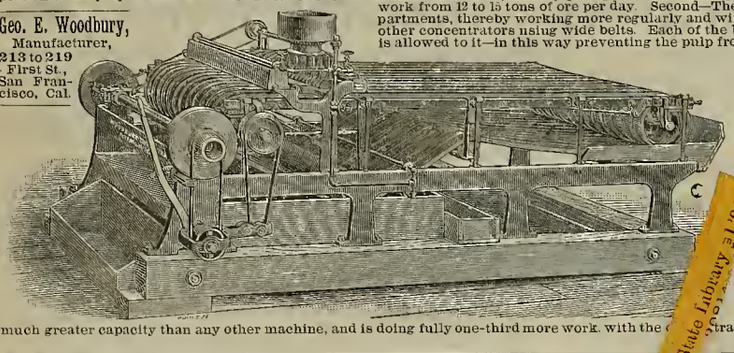
Centrifugal Roller Quartz Mill.

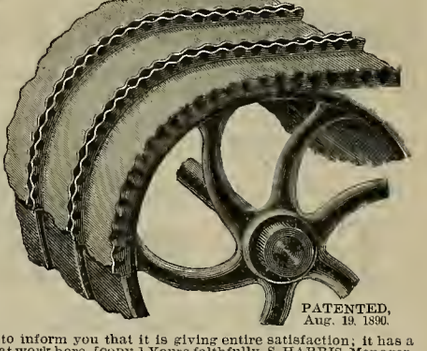
THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS

was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891 with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. **Price $575 f. o. b.** Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

Geo. E. Woodbury,
Manufacturer,
213 to 219
First St.,
San Francisco, Cal.





PATENTED, Aug. 19, 1890.

THE SAN JACINTO ESTATE—Office of the General Manager, Cajalco, Oct. 30, 1891.

GEO. E. WOODBURY, ESQ.—Dear Sir: In reply to yours of the 27th inst., respecting the working and efficiency of the "Woodbury" Concentrator placed in our works by you, I am pleased to inform you that it is giving entire satisfaction; it has a much greater capacity than any other machine, and is doing fully one-third more work, with the [illegible] rates equally clean, as from either of the machines at work here. [COPY.] Yours faithfully, S. HARRIS, Manager.

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 6.

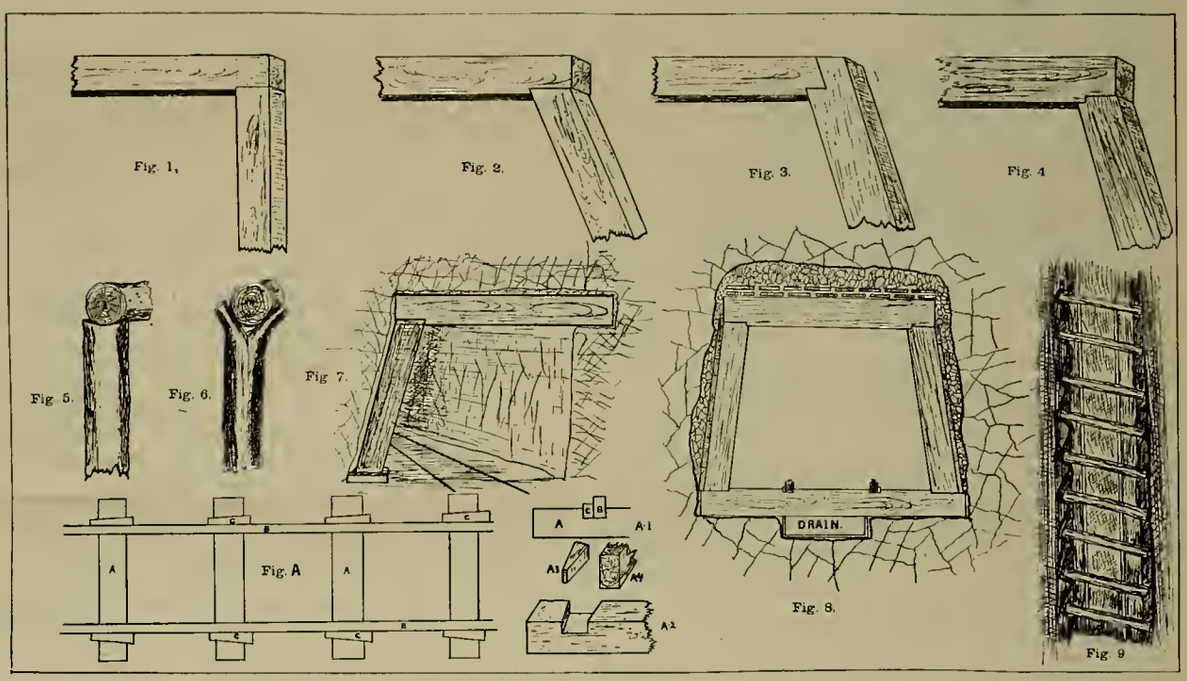
SAN FRANCISCO, SATURDAY, AUGUST 11, 1894.

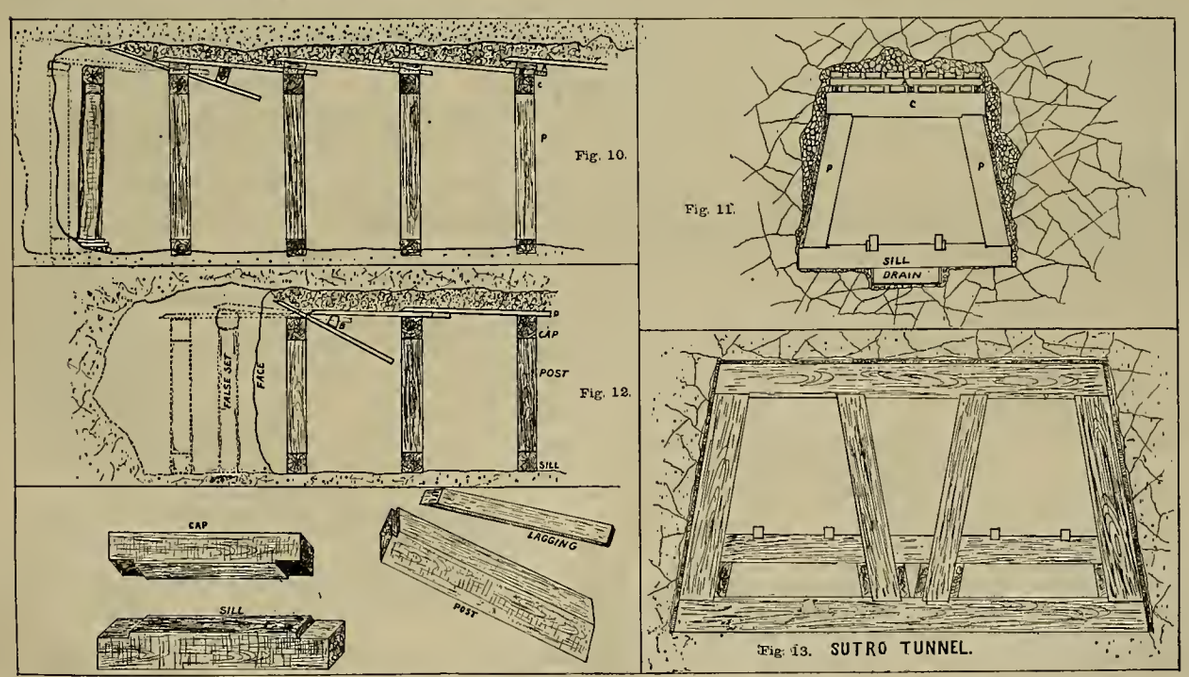
THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Methods of Mine Timbering.

In last week's issue reference was made to Bulletin No. 2, issued by the State Mining Bureau, treating of methods of mine timbering. The treatise is considered worthy of reproduction. It is a compilation of practical, up-to-date methods and is of manifest value to every mine-worker wherever timbering is required. Some changes have been made to conform to the columns of this journal, such changes having no reference to the matter beyond its necessary adjustment.

The excavation of any considerable amount of earth, or rock, beneath the surface of the ground usually necessitates that the roof, and not infrequently the sides, of such excavation be sustained artificially to prevent caving. In these later years the size of underground excavations is so great, as compared with those formerly made, that the ingenuity and skill of the miner is taxed to the utmost limit. So successful, however, have miners become in devising novel methods to meet daily exigencies that the obstacles usually encountered in mining, among which are flakey rock roofs, soft, running ground, floods of water — sometimes scalding hot — and, worst of all, swelling ground with heavy pressure from all sides, including the bottom, have mostly been successfully overcome.





METHODS OF TIMBERING IN MINES. — (See page 84-85.)

Before Deidesheimer's "square set" system came into use, the ingenious placing of posts, caps and "stulls" constituted the only method of timbering, the multitude of conditions met in the mines making the combinations almost endless. Where veins occur in firm, solid rock, being perpendicular, or near it, the danger of caving is greatly lessened, and the amount of timber required is reduced to a minimum, but these conditions are exceptional.

Veins dip at all angles between perpendicular and horizontal, and vary greatly in width. Moreover, the character of the wall rocks, as well as of the ore itself, is so variable that unexpected problems are encountered daily. The shape of large bodies of ore is a matter of great importance in determining the system of timbering to be employed.

Through all this variety and change in form, dip, size and character of the vein, or deposit, and in the inclosing walls, certain established principles are followed in sustaining the roof and sides, the constant aim being to prevent caving, and to avoid such a catastrophe timbers are placed with a view of holding the rock masses in place, and always in such a manner as to receive the strain directly. Those timbers which reach from wall to wall of an inclined vein (stulls) are not set at a right angle to the pitch of the hanging wall, but at a somewhat higher angle. The reason is obvious, for, if placed at a right angle, should a subsidence of the wall occur, the timber, partaking of this movement, at its upper end, would then have a tendency to fall of its own weight, whereas, if set originally above an angle of 90 degrees with the hanging wall, the subsidence of that wall only serves to wedge and hold the timber support more firmly, when it must bend and break before falling. When properly placed, stull timbers usually give sufficient warning of their weakness to permit of plac-

(Continued on page 84.)

MINING AND SCIENTIFIC PRESS.

Office, No. 220 Market Street, Northeast Corner Front, San Francisco.
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Annual Subscription, $3. New Subscriptions will be declined without cash in advance. All arrearages must be paid for at the rate of $3.50 per annum.

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Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, August 11, 1894.

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RECENTLY car painters in Chicago struck through sympathy for car painters at Pullman. Now the former Pullman car painters have taken the places of the Chicago car painters at lower wages, and the comments of the former Chicago car painters are not flattering to their own self-esteem.

REGARDING the suit against the Bear's Nest mine-owners by Mr. Renshaw on behalf of his English associates, Capt. Carroll, one of the parties interested in the suit, says he will sue the allegators of the charge that the mine was "salted." Should both proposed contests be fought to a finish, the umpire's decision will hardly meet with mutual acquiescence.

CONSIDERABLE comment was made during the past year on the action of the Queensland Mining Government who paternally assisted Australians out of work by sending them out to find gold. The mining papers there said it was a mistake, and it seems that the Government, after a thorough trial of the idea, now thinks so too. The opinion there is that no good resulted from the money so expended, and the Australian *Mining Standard* says the money was "frittered away." The Australian Minister for Mines thinks that any money spent in the future should be upon lines for the purpose of finding gold at different levels on fields already worked. It is in pursuance of this idea that work for deep sinking on gold fields has been proposed.

A COMPETITIVE EXHIBITION of gold-saving machinery is to be held at Sydney, N. S. W. All machines and appliances are to be in full working order; there will be a special classification for models and plans. An Australian mining exchange says the schedule is of a character embracing "classes for alluvial and reef gold-saving machinery, beach washers, crushing machinery, amalgamators, ore pulverizers and rock breakers, calcination systems, models of shaft and drive timbers, systems of reduction of concentrates, pyrites, etc., hydraulic sluicing machinery, and a variety of other things connected more or less directly with the mining industry. It is contemplated also to offer prizes for essays upon the subjects of both reef and alluvial mining, from the point of pegging out claims to retorting the gold, including the systems of working; also for model regulations for the guidance of mine managers and for a prospector's guide, and papers on other subjects." The authorities have granted the use of the Exhibition building. The general arrangements for the exhibition are in the hands of W. A. Macarthur, of Sydney.

Valuation of Mines.

Surprise is sometimes expressed that men will put their money into mining ventures in far-off, out of the way regions when better prospects lie so near. The surprise is enhanced by the knowledge that climate, resources and facility for securing machinery are infinitely superior in the neglected field.

There seem to be two reasons for this. In the first place, in those semi-barbaric districts, inhabited by sleepy, unprogressive people, indifferent to or ignorant of the value of mining property, the superior race finds little difficulty in securing at small cost valuable undeveloped properties, sometimes appropriating them without even the formality of purchase. In these instances the first cost is of no import. In some parts of this and other States everything probable and possible in the way of a prospect is already in private ownership, and once a "location" is made, it is sometimes held at what a would-be purchaser deems too high a figure.

In the second place, the obscure, remote and isolated character of many of these far-off localities lend an added charm to the promotor or middleman, who looks upon such difficulty of reach and research as of value to him in preventing too much knowledge of the matter on the part of the shareholders whom he has in mind.

It is concerning the first probable reason that a word or two may not be wholly out of place.

Most things for sale are "worth what they will fetch." 'Tis different with a mining claim. Sometimes it is worth less than the purchase price; oftentimes more, but, in the case of buying and selling mining property, that is a matter that ordinarily must be determined after the transfer is made. A man may pay $10,000 for a piece of mining property that will show itself worth $1,000,000 after he has spent a few thousand additional dollars on it or it may not be worth the amount annually necessary to expend in order to hold it. For this reason nothing is more difficult to determine than the exact value of a mining claim; therein lies the element of risk. The same general site, appearance and showing that made one claim worth a million will not hold good in the one adjoining it. The apparently high price set on a prospect or location is what deters so many would-be investors from buying. Of course, the probable purchaser will naturally want to buy for as little as possible; the seller wants to dispose of it for all he can get; but there is ordinarily no standard of value, and, hence, an agreement as to what is mutually satisfactory is difficult to be reached. A prospector will search patiently for weeks and months, find a claim, and open it up to the extent of his financial ability; to him it represents a good deal of time, toil, hardship and skill, and when a purchaser does come along the prospector is not apt to undervalue his property. But by holding out for a larger sum than reason and experience tell him he is likely to get he stands in his own light, and so far as he is individually concerned, creates that condition which is the subject of comment. There is the element of chance that must be divided: the chance that the buyer may pay more than the mine is worth, and the chance that the seller may let a really valuable property go for too small a sum. As a general thing the buyer gets the best of it. Some of the biggest fortunes in California to-day are held by men who got their money from mines that other men found and they secured at a trifling outlay.

But, in this connection it must be borne in mind that the time has gone by, in California at least, when a man buying a mining claim does it with the intention of organizing a company, listing the stock, and working the street instead of the mine. Nowadays a buyer of mining property is simply investing his own or somebody else's money as a business proposition; he intends to develop it and run it as any other legitimate business would be carried on. Because of this, the first cost of the mine is of more importance to him than if it were to be made simply the basis of speculation. The time when an atmosphere existed in which to flap the wings of fancy is no more. Because of this it is believed it would be more in line with the requirements of the situation for holders of claims to look at matters as they exist, and think twice before a reasonable offer is refused.

There is more gold, a hundred times more, in this State than has ever been taken out; there are hundreds of valuable prospects held by men who have grown gray in possession; there is a better field for investment of capital in gold mining in this State to-day than anywhere else in the world; there is more present desire to invest in legitimate mining than ever before. Putting these facts together it is unnecessary to more than suggest that the advantage possessed in this regard is not increased by any disposition to let investors pass to other fields by putting too high a price on the property they seek. In these sunset years of the century men will not take the big chances they used in the purchase of possibilities.

An Unfounded Theory.

In the *Engineering Magazine* for July is a page that should not go uncontradicted, wherein is asserted that the "character and tone" of the precious-metal miners are behind what they used to be in the days of auld lang syne. In this assertion the ordinarily exact and commendable comments of our contemporary are at variance with the facts. Both in "character and tone," the gold and silver miner of to-day compares favorably with any in the past. In all that goes to make a man there is no deterioration. He is just the same patient, plucky, persevering, hopeful mortal he always was; just as full of work and energy, just as devoid of petty meanness; just as enterprising and intelligent; more peaceable and practicable in his methods, and as open-handed as his surroundings and circumstances will permit.

The argument of the *Engineering Magazine* in the article referred to is that civilization and the railroads having made travel and life generally easier, the miner of to-day has gone backward and lost the manly qualities that characterized the miner who crossed the plains or came around by the Isthmus or the Cape.

Far be it from us to deny the good qualities of the miners who founded this and other far western States. In the days when none but the daring started, and none but the strongest survived, there came a grand contingent of sturdy men who, in their day and generation, wrought greatly. All praise to them.

But, as they pass away, their successors display no less the possession of the same qualities that made the pioneers heroic. True we ride in easy cars to-day across the way they blazoned with their bones; true the haze of violet-colored sentiment that always irradiates the past does not enwreathe the sunlight of the present; but it is not true that the miner of '94 is inferior to the miner of '49; "or the spring of '50;" nor is it likely that were the men of the preceding generation here to cope with the changed conditions of to-day their achievements would exceed those of their worthy successors. While "it is natural for man to indulge in the illusions of hope," it is also natural for some men to indulge in the illusions of memory. When one is retrospective he always thinks of the pleasant occurrences; the successes; the flushes of triumph and other "flushes" that were temporarily successful, and usually ignores the troubles that beset all men alike in all years. So in writing of "old times" in mining regions 'tis only natural to gild the glory of a bygone day. That is all right; but it is not just to say that the men of to-day who unlock the nation's treasure house are in any way inferior to them who first found where lay the precious store.

The miner and the walking delegate, it should be remembered, are two different types of humanity.

FROM Prescott, Arizona, comes complaint regarding the passage of the recent bill suspending the requirement for assessment work on mining claims for this year, it being asserted that it does not benefit that section. As the bill is passed now, it seems needless to hold any post mortem on adverse comment. It is in order, however, to suggest that the laws Congress makes or suspends are for the entire country, and as in all such cases of wide-spread jurisdiction, it is impossible to expect unanimity of opinion concerning their effect.

Concentrates.

THE Park Gold Mining Company has incorporated at Denver with a capital stock of $750,000.

THREE HUNDRED THOUSAND silver dollars will be coined at the San Francisco mint this month.

THE North Banner Consolidated Tunnel Company has levied an assessment of five cents per share.

THE Golden Chain Mining Co. of Lake county, Col., has been incorporated with a capital stock of $100,000.

THE Allegheny and Cripple Creek Mining Co. of Col., with a capital stock of $1,000,000, has been incorporated.

W. W. RODEHAVER is charged with embezzling funds belonging to the Placer County Miners' Association.

THE Alaska *Mining Record* says that the gold output for last year in the Silver Bow basin there exceeded $120,000.

A SON of Major-General O. O. Howard is putting up a 20-stamp mill on the Holdsworth mine, Meadow Lake district.

THE coal mines in southern Colorado and New Mexico reopened last Monday, giving employment to about 2500 men.

THE Medford, Or., bank has a $1000 gold brick, the result of a clean-up of the Hammersly Mining Company, after a ten-days' run.

THE Ontario government has bought two diamond drills for exploration purposes. One will be kept at Toronto and the other at Rat Portage.

A STRIKE of free milling gold ore is reported in the Annie lode, fifteen miles east of Mosca, Col. Alleged assays give a result of "$42,000 per ton."

THE Lookout Mountain Gold Mining Company has filed articles to do business on Gold creek, in Granite county, Col. Capital stock, $500,000.

THE Cochiti, N. M., Mining and Milling Company have their new mill and amalgamator at work, turning out at present thirty tons of ore daily.

LA VITA, Colorado, and vicinity are elated over a strike that has been made on Silver mountain. The ore is said to assay over $700 in gold to the ton.

THE Gold Valley Mining Company has been incorporated by C. C. Melver, W. X. Sellar of London, J. W. Seymour of Texas, H. Steil and D. Cushman.

JOHN D. BEAM, manager of the Livecoaks Mining Company at Coarse Gold gulch, was crushed and instantly killed by the fall of a hanging wall at the mine last Saturday.

THE Jacksonville, Or., *Times* says some Chinese who are mining on Elliott creek were surprised by white men at dinner last week and robbed of about $200 in gold dust.

THE insurance men are willing to rebuild the mill recently destroyed at Hiko, Nev., but, with the present silver outlook, the owners would rather have the insurance money.

THE last clean-up of the Reno Reduction Works amounted to $1733. The owners of the Golden Eagle mine from which the ore was taken are prospecting for a large deposit of ore.

THE Denver *Record* thinks a dead line should be drawn on the finding of "the richest gold mine in the world" again for three months. It has been found six times in four weeks.

THE Sand Creek Mining and Improvement Co. has organized in that Montana district with $1,000,000 capital stock. The company has twenty-one claims that it proposes to develop.

FOR half a million, cash, the Portland Gold Mining Co. of Colorado Springs, Col., becomes the owner of four mines adjacent to its present property, thus stopping costly litigation.

POORMAN, Idaho, stock is now quoted at twenty-three cents, a falling off of more than fifty per cent during the past six months. The depression in the silver-lead industry is the cause.

THE Los Berros gold mine, sixty miles from San Miguel in the Jolon country, cleaned up $2800 for the month of June, and during the three years of its existence over $250,000 has been taken out.

WILLIAM LOBE, employed in the Stickle mine, at Angels, fell 150 feet off the side of a skip last Saturday and was instantly killed. He was a native of Cornwall, England, aged forty-one years.

PORTER BROS., who have been identified with some large mining deals in the Cœur d'Alenes, are negotiating for the Little Pittsburg mine in Spring gulch. The mine is a copper-silver proposition.

EX-SENATOR TABOR'S mining property at Vulture, Arizona, has been attached to satisfy a claim of $7820 of the National Bank of Madison, Wis., and one of $11,200 of the National Bank of Springfield, Illinois.

THE Hecla Consolidated Mining Company at Glendale, Montana, on July 25th paid the 127th dividend of one per cent ($15,000), making the total dividends paid up to date under the present management $1,905,000.

JOHN HAYS HAMMOND is on his 1500-mile journey through British South Africa to inspect and report on the mines owned by the company, for which he is managing engineer, and which pays him an annual salary of $60,000.

THE Keaunedy, Nev., *New Era* says there is a mining notice near that town which reads: "We claim 1500 feet in a promiscus directum along the curse of this vane. This claim shall be nowen as the Blew Id Nel."

SENATOR STEWART'S new mining law, recently published in full in these columns, has passed the Senate, and may, with some amendments, pass the House this session. In its present form the bill is not wholly unobjectionable.

AT Hillsboro, New Mexico, placer miners screen their gravel through a series of meshes, reducing it to one-tenth the original bulk. The gold is found in the concentrated product sent to the mill to be amalgamated.

GEORGE BENDIE, a prosperous and wealthy mining man of southern Mexico, was assassinated last week in San Nicholas Del Ora, where he owned several valuable mines, by a former employe, a Mexican named Reyes, who escaped.

THE United States Court at Denver has made a decision by which Margaret Billings and others, heretofore comparatively poor people, are given $740,000 in money and a thirteen-forty-seconds interest in the Emma mine of Aspen, Col.

THE valuation of the Harqua Hala (Arizona) Bonanza mine has been raised for purposes of taxation from $50,000 to $150,000. The property is said to have been sold last year for $1,000,000, and to be producing $300,000 in gold bullion per annum.

THE Winnemucca *Silver State* says: A silver camp will soon spring into existence south of Winnemucca. Assays taken from ledges give over 100 ounces in silver and a few dollars in gold. An assay from Virginia City showed 175 ounces in silver and $9 in gold.

C. W. MILLER, F. Patterson and J. D. Cook of Portland, Or., have incorporated the Farmer's Flat Mining Company with a capital stock of $40,000. The company will do general mining business, principally near Jacksonville, having purchased the Miller mine for $12,000.

THE discovery of lead carbonate—the ore which gave Leadville its boom—is considered by mining men important for the Cripple Creek, Col., district. The vein is reported to be four feet in width, and is all pay. An assay returned $40 in gold, 280 ounces silver and 33 per cent lead.

THE recent effort to organize a stock company to buy and work the Magalia mine was a failure. N. D. Rideout, the owner, proposes to sink a vertical shaft 500 feet, through which to pump the water. It is believed were the water got rid of the property would be a good paying one.

STARTING within the limits of Denver and extending about twenty miles up and along the course of Cherry creek, says the *Record*, 150 men are now extracting gold from dirt and gravel and making it pay. Most are washing, but in several instances dry placer machines are used to do the saving.

THE Tombstone *Epitaph* reports that the Quijotoa property, comprising the last of the Bonanza Company's possessions, has been bought for the nominal sum of $3500. This property originally cost in the neighborhood of $250,000, and consists of quartz mill, pump, well, piping and mining implements.

AT Florence, Col., the work of putting machinery in place for the Economic Reduction Works is about finished. The plant will have a capacity for treating 500 tons of ore per day, high or low grade, refractory or free milling, by processes which it is claimed will save all the gold there is in the ore.

THE *Journal-Miner* says the Zero mine in the Hassayampa district is one of the most remarkable in this country. It is said to have paid $100 per foot for every foot of development work done in sinking and drifting, and this, too, with silver only sixty-two cents per ounce, the property being a silver producer.

THE man who robbed the Alaska-Treadwell chlorination works of $13,000 last January has been arrested in the act of disposing of some of the proceeds of the robbery. The chlorinations when stolen were taken seventy miles to Admiralty Island and buried, to be resurrected when the excitement was over.

PETER MCCOURT, manager for Senator Tabor, said in Prescott during his recent visit that he would return in about a month and resume work on the old Vulture mine. About $150,000 will need to be expended in a new mill, in a new pipeline and in a new shaft and lower working before any bullion can again be turned out.

THE Derbec mine has started up again. An arrangement was made with the men to take what comes out of the mine. If the yield of one month is more than $2.50 per day, the surplus will be set aside to make up any subsequent deficiency. The company wanted to reduce the pay to $2 per day, and the above is the result of arbitration.

THERE is considerable mining on the Laramie river at present, and extensive works have been started. Wm. Taylor of Rock creek is doing the most work and is getting good returns. The gold dust is very fine, and gold-saving machines of all kinds are used. The old way of sluicing has been found unprofitable, owing to the lightness of the gold.

THERE are about 300 men at work in the Bohemia, Or., mining region. Two stamp mills are running, and a ten-stamp mill is on the road. Some Tacoma parties will also put in a mill soon. Some ore recently sent to this city from the Bohemia mines is reported to have assayed over $7000 to the ton, which has had the effect of increasing the mining fever.

AT the present time, says the Marysville *Appeal*, the Yuba river, near Parks' Bar, very forcibly reminds one of the sea beach at low tide to see so many parties with spade and bucket, digging holes in the sand here and there, not, however, in search of bivalves or goldfish, but fishing for gold. It is generally understood that some of the miners are very much encouraged with their prospects.

AT Dayton, Nev., last Sunday, nearly all the wood near the Carson river was destroyed by fire. Empire Longabaugh lost 1600 cords, and the Carson & Colorado Railroad Company lost 2165. The fire was of incendiary origin. The fire took place between 2 and 3 o'clock in the morning, and was plainly seen at Virginia, Nev., twelve miles distant. The wood is said to have been insured for $5 a cord.

THE Elko, Nev., *Independent* says: Chas. Graff, from Mardis, brought thirteen ounces of gold dust taken out of the placer claims by himself and partner in two weeks. The gold runs from $18 to $19 per ounce. Graff says that things are booming in the Mardis district, and that there were no idle men, as everybody willing to work has no trouble in finding it.

AN assessment of two cents per share has been levied by the Odin Gravel Mining Company. The Nevada *Transcript* says operations are going ahead very satisfactorily at the mine. It is expected that the rich part of the gravel channel, towards which a drift is now being run, will be struck about the last of this month. In this event it is almost a foregone conclusion that assessments will cease.

REGARDING the falling off in the Bendigo gold yield, the Australian *Mining Standard* says: In the six months ending December last the yield was 116,047 ounces, while the returns for the six months ending June, 1894, show a decrease of 32,601 ounces, the dividends in the same period being £87,913 less than were paid in the last half of 1893. Mining at Bendigo during the first half of the present year has been carried on at a loss.

A PARTY of miners, consisting of W. Snyder, A. Goodwin, Jeff Goodwin and J. H. Fick, of Forest Hill, have gone to North Bloomfield to take charge of a boring machine that is to be used there in prospecting, says the Colfax *Sentinel*. The gentlemen have had charge of the boring machine at the Mayflower for the past year and have used it very successfully. The new machine was fitted up in San Francisco. The boring machine before many years will prove to be a very efficient instrument for prospecting without such great expense.

"ONE of the best showing pieces of property in Colorado was discovered through the constructive instinct of a prairie dog," says P. A. Church of Boulder. "A man named Burr, who found the property, was attracted to it by the sulphides lying at the mouth of the excavation made by one of these little animals. Mineral was found in less than ten feet, running first over $4 and steadily increasing. As the work progressed deeper the returns from the various assays taken at different depths showed about $4000." The mine referred to is the Ella H., which is located at Balfour, and which is at present being worked with much vigor.

THE Tombstone *Epitaph* reports that the Congress mill is dropping forty stamps and rolling sixteen concentrators, which keeps four men sewing up ore sacks, averaging 160 pounds to the sack. The company is also shipping about forty tons of high-grade ore daily. The company has at present 136 men at work underground. The mine shows an abundance of ore throughout all the numerous workings. At the 1000-foot level there are fourteen men at work, and their labor has disclosed a breast of seven feet of high-grade ore, and the ore continues on down below the 1000-foot level, and seems to widen on its downward course. The ground at the lower levels works much easier than that above.

A MAN'S skeleton was found between Cargo Muchaco and Pichaco, in the eastern end of San Diego county, last week, by Benjamin Page of Yuma. On the ground in the vicinity of the skeleton were found a pocket-book, watch, keys and small change, and an envelope addressed to "Peter Zanovich, Yuma, Arizona." A man by that name left Yuma two months ago for this State. The circumstances indicated that the man was on his way to Cargo Muchaco, and, being unacquainted with the country, had been overcome with thirst. Coyotes had devoured the flesh. The skeleton was buried where found, and steps were taken to learn if it was the remains of Zanovich.

A DENVER man says he has discovered a process and has applied for a patent upon a device which will save 90 per cent of the gold in placer mining. The contrivance consists of a number of copper plates, inserted in zig-zag fashion in a sluice, whose dimensions are 3x14 feet. At the top of the sluice-way is a depository for chemicals which aid in retaining the gold deposited when free from sand and gravel in the riffles of the machines and in two deep pockets arranged for the reception of the deposit. The inventor says he has made a test which fully demonstrates the utility and efficiency of the machine. A $5 gold piece was dissolved by muriatic acid, the deposit mixed with sand, and by the aid of this device he says $4.65 was saved.

ACCORDING to the Aspen *Sun* there are 519 salaried miners and 571 leasers working in the mines around Aspen, Col. This does not include office men or men connected with mining companies other than those strictly miners. The number of leasers is no criterion that none receive pay, as it is sure that one out of every three of the leasers receive pay, and are hired in the same manner as the miners. This swells the number of paid day miners to 676, and makes the leasers 314. The wages paid out to the 676 men, allowing $3.25 a day which is a low average, are $45,630 per month, and are nearer $50,000, as the average will be close on to $3.40 per day. Some leasers make money and some don't, but still there is more than $36,000 a month distributed this year than last.

BLACK SAND is being worked at Manti, Utah. The gold is covered by a sort of asphalt, or black wax. This coating must be removed by some acid process before the gold can be collected. The first assay gave $74.24 per ton, and was made from a shot sack full of sand taken from different places now claimed by the Red Creek Company. Pannings of 2500 pounds of sand taken from one place gave less than $5 per ton. If an assay of $20 per ton can be secured, the company will probably continue operations. The entire ground seems to have been worked at some time in the past. A wall surrounds the whole sand bed about three miles in length. This gives evidence of having been constructed for the purpose of working the sand by some process. While digging for bedrock, the prospectors found that the ground had been worked once. This fact gave credence to the story that a veritable old Spanish mine had been discovered. One man claims to have found the ruins of an ancient smelter near the Red creek camp.

Clipped and Condensed.

THE republic of Hawaii has been formally recognized by the United States.

THE Pacific railroad funding bill goes over to next winter's congressional session.

THE tariff bill has reached a favorable stage of compromise between the House and Senate.

C. P. HUNTINGTON is trying to buy the recently completed railway across the Tehauntepec isthmus.

STATE TROOPS have all been withdrawn from Oakland, Truckee and Dunsmuir. Gen. Dimond declares "the war is over."

THE House bill appropriating $50,000 for the construction of a revenue cutter for San Francisco harbor was passed last Wednesday.

IN the Corean war, the Japanese have so far defeated the Chinese by land and sea. China refuses European or American mediation.

CHARLEY MITCHELL, the former proprietor of the Grass Valley *Union*, is receiving many congratulations upon his appointment as refiner at the S. F. Mint.

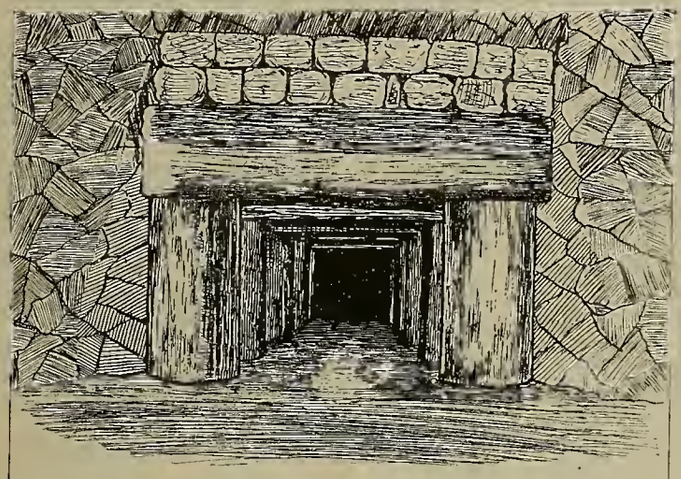
Methods of Mine Timbering.

(*Continued from page 81.*)

ing additional timbers and subsequeutly the removal aud replacemeut of old or weak timbers.

To make an understanding of tbe various practices more compreheusive, a number of drawings have beeu introduced iu this article. As a matter of course, certain exigencies are likely to arise, the character of which has uot been anticipated, but in all cases the principles applied remain the same, and it is thought that the conditions most likely to occur have been treated fully enough to meet the demands of metalliferous mining geuerally.

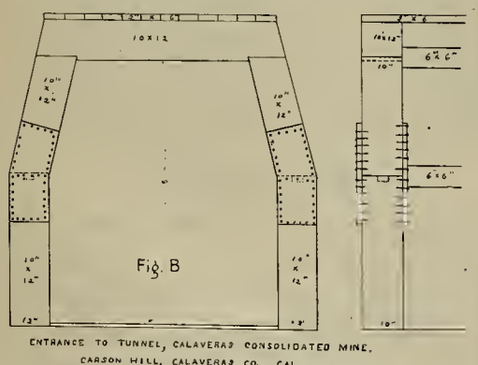
In some instances solid masonry is built to sustain certain portions of mines, and in late years iron has been introduced as a substitute for timber, but in American mines timber is most commonly employed. Ordiuarily tbe location of the mine determines the



ENTRANCE TO AN OLD MINE IN HONDURAS

kind of timber. Piue of various kinds is more extensively used than any otber. Sugar pine and spruce are preferred when obtainable, but yellow pine is by far the most common. Oak is gladly taken when good sticks of sufficient size cau be found. There are oak timbers in mines in Mariposa county, apparently sound, that have been in place for twenty years. They certainly outlast any other timber. Cottonwood aud redwood are sometimes used when no otber is obtainable, but are not at all desirable. In the desert in tbis State, iu parts of Arizona and Nevada, miners take any timber they can get, even resorting to the yucca, which answers quite well for a time in that dry climate, wheu the pressure is not too great. At Silver Reef, in San Bernardino couuty, greeu yuccas were used iu timbering a drift. They still stand iu fair condition, baving been in place five years. The superintendent of the Gover mine, Amador county, California, has commenced some experiments with spruce and sugar pine, placing tbem side by side in the same set in the lower levels of his mine, to test their durability.

The method employed to sustain the roof aud sides of tunuels and drifts are numerous, the existing conditious determining the method. Often the rock is sufficieutly firm to stand without timber, but at times the conditious are annoying and daugerous.



ENTRANCE TO TUNNEL, CALAVERAS CONSOLIDATED MINE, CARSON HILL, CALAVERAS CO. CAL

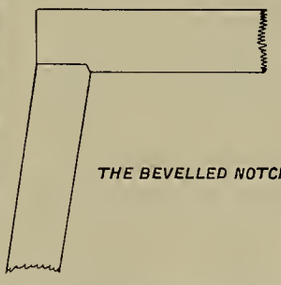
Where the pressure is entirely overhead an upright post is set on either side of tbe tunuel, usually spread somewhat at the bottom, but otherwise always at right angles to the roof. (Drifts are frequently run on an incline, particularly iu blanket veins, and also in fissures having a low angle of dip.) (See Figs. 2 and 4, on page 81.) On these posts are placed a cross-piece called a cap.

When it may occur that the floor of a tunnel, drift or crosscut does not afford a firm fouudatiou for the posts, as in soft, wet fissures, when not in ore, or, as is ofteu the case at the eutrance to a mine, a cross-piece or sill is first laid aud the posts set upou it. A second cross-piece (the cap) is then inserted at the top, the ends resting upon the posts, the cap being employed in all cases, whether tbe sill is necessary or not.

In working ground that is fairly firm, particularly in the drift gravel mines of California, a system of posts and "breastiug caps" is used. Tbis consists of a piece of timber hewn or split, two and one-half feet loug, one foot wide and three or four inches in thickness (the eap). which is placed against the roof, and a post of the neccssary length is set beneath it, being driven into a perpendicular position by blows of a heavy hammer or maul. It is a cbeap aud secure method of timbering small drifts, and is often employed iu large ones, the breast extending entirely across the channel. Lagging placed at right angles to the cap may be driven in above it wbeu necessary.

Very ofteu pressure is exerted from the sides as well as from the top of a drift. In such cases the timbers are framed with a view to bindiug them more firmly together when in place. (Fig. 8.)

Figs. 1, 2, 3 and 4 show several styles of framing timbers for drifts. Of these Fig. 4 is undoubtedly the best. Better than any of these is the bev-



THE BEVELLED NOTCH

eled notch, whieh greatly reduces the liability of the timbers splitting. It has come quite extensively into use of late years. When properly framed and set there is little danger of slipping. Still another, and no doubt the best method of all, has lately come into practice. It is that of nailing a two-inch plauk on the under side of the cap. By this device the fullest strength of the timber is obtained, with no probability of splitting.

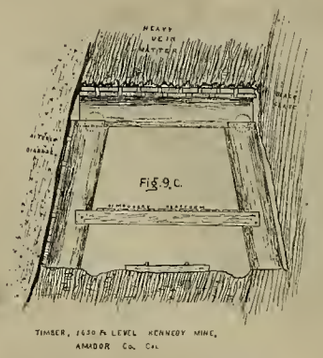
When round timbers are used they should always be stripped of the bark or they will speedily decay. The manuer of framing timbers is the same, whether they be round, bewn or sawed.

Figs. 5 and 6 show a method of placing posts aud caps. It is seldom seeu now. There is nothing about it to recommend it. Oak is the only timber that may be safely employed in this manner, piue being too soft aud quite certain to split.

Where one side of a drift only and the roof need support, the post and cap (Fig. 7) is sometimes employed. One end of the cap rests upon the post, the other on a shelf, or niche, cut in tbe opposite wall.

LAGGING.

When the roof or side of a tunnel is loose and shows any tendeucy to cave, sprawl off or run, lagging must be employed. Lagging is the name given to strips of wood 4 to 6 feet long, 6 to 8 inches wide, and 2 to 2½ inches thick. They are usually split from piue logs, but sometimes 2-inch plank 6 inches iu width is sbustituted. In large shafts in heavy



TIMBER, 1630 ft LEVEL KENNEDY MINE, AMADOR Co. Cal.

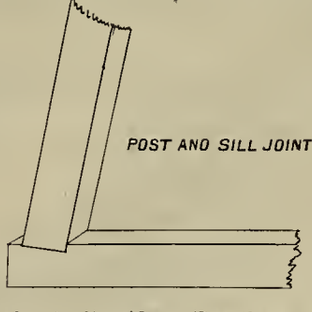
ground 3-inch plank is sometimes employed. The methods of driving lagging are shown in Figs. 10 and 12. The pieces of lagging are inserted over the top of the cap, the euds pointed upward a few degrees. They are driven forward as the work of excavation progresses, when there is danger of caving. Not infrequently ground will stand for many hours, and sometimes for months, before caving, but it is cheaper to timber very soon after the excavation has been made, in order to keep the ground in uormal condition, giving it no chance.

The two systems shown in Figs. 10 and 12, while tbe same in principle, differ materially in detail. In Fig. 10 the lagging is inserted between two caps, which are separated by wedge-shaped blocks, oue of which is placed in the center aud one at either end. (See between A and C, Fig. 11.) The lagging is driven forward as explained. If the ground is very heavy, a "false set" (Fig. 12) is set up, and the ends of the lagging rest upon it. The excavation progressiug and the lagging being driven well forward, the next set is put in position and the lagging driveu "home," that is, until the forward ends find a secure resting place on the true set. The false set is then knocked out and the same proeedure gone through with the next set.

The only differeuce between Fig. 10 and Fig. 12 is that in the former there are two caps, as explained above, while in Fig. 12 the lagging is inserted beneath the forward ends of the next set back. In each case the lagging is kept pointing slightly upward by the insertion of a block of wood shown at B, Fig. 12. When the forward ends of the lagging rest on the false set this block may be allowed to drop out. The system shown in Fig. 10 can be employed much more advantageously and work progress more rapidly iu very heavy ground than when that shown in Fig. 12 is used, which does very well in lighter ground. Where the ground is very bad the lagging must be kept driven as far forward as possible. By observing eare in this matter serious runs are sometimes prevented. Sills are only employed when the bottom of tbe tuuuel does not afford a firm foundation for the posts.

For lagging, spruce, yellow pine and tamarack are much used, but the sugar pine of California has no superior for toughness and durability. Lagging sbould not be too stroug, for in the event of extreme weight it should bend and give notice of impending danger. The miner may then relieve the pressure by cutting away a portion and reinforcing the timbers, thus saving the more expeusive framed timbers and perhaps preventiug a serious eave.

Caps aud posts are all sizes from 4x4 or 4x6 inches up to 24x30 inches, according to the size of the excavation and the character of the grouud. Caps should be free from knots aud checks as far as possible. Less care is necessary in the selection of posts, though all timbers sbould be of good, sound wood. Sills extend somewhat beyond the posts which rest upou them. A shallow notch is usually cut in the sill to admit the post, the bottom of which is cut at



POST AND SILL JOINT

right angles to its sides. (See the accompanying figure.)

The greater care taken iu framiug aud setting up mine timbers the less danger there will be of collapse iu the future. The tools necessary to secure this exactness are a plumb bob aud a steel square. A spirit level is also very useful.

To coustruct a track, cross-ties made of 3x4 scant-

ling are often laid on the floor of the tunnel or drift, and to these are spiked "T" rails. When flat iron is preferred a durable track for permanent use is made by setting long 2x4 scantling in slots sawed in the cross-ties, the long strips being secured by driving in wedges at the side. The details of track construction are shown in Figs. A, A1, A2, A3 and A4, which are on the same plate as Figs. 1 to 9. Upon the scantling stringers may be spiked the flat iron, or, if desired, "T" rail. The scantling should not be spiked to the cross-ties, as nails are quickly corroded by the mineral vapors and waters of mines.

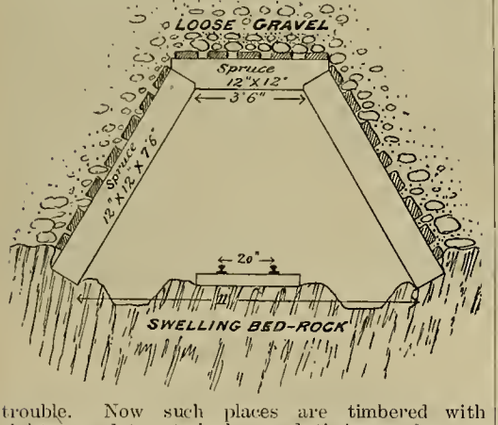
Provision for drainage should always be made at the very commencement of opening a mine, for, though the tunnel may be dry at its mouth, when it has been driven a long way into the mountain more or less water is nearly always encountered. A drain or trench should always be cut in the center or at the sides of every tunnel or drift. Illy drained workings cause the timbers to rot quickly, and also endanger the health of the miners. Neglect to provide drainage very often results in the necessity for retimbering, which expense might otherwise have been avoided for a long time.

Prospectors, in their haste to advance work as speedily and as cheaply as possible, frequently fail to timber properly and to provide for drainage, with disastrous results in the future. Many months of laborious toil are too often lost in this way, to say nothing of the loss of life and limb by the unfortunate miner caught in a cave which might have been easily avoided.

One of the greatest difficulties with which miners have to contend is the swelling of the rock masses into which their excavations have penetrated. Often the force or pressure against the timbers caused by the swelling of the ground is irresistable. It is a common feature of many of the mother lode mines in California, particularly in Tuolumne, Calaveras and Amador counties. Swelliug bedrock is quite common in the gravel drift mines of California. All Comstock miners know what swelling ground is. It is one of the most serious obstacles with which they have to contend.

In a general way it may be said that the only recourse is to timber in the most substantial manner, and then, by frequently, as is often necessary, cutting out a portion of the heavy ground and relieving the pressure, the timbers may be kept in place and the excavation kept open. Fig. 14 represents a cross-section of a tunnel where the trouble in its worst form was encountered. By setting timbers in the manner shown in the cut, placing the sets close together, and relieving the ground by the removal of the encroaching portion from time to time, the trouble is reduced to a minimum. In the Hardenburg mine, Amador county, swelling ground has caused a great deal of trouble lately. The 900-foot level is run in a zone of crushed foliated black slate, which, on the footwall side of the drift, when first broken appears firm and solid, but in a few days it commences to spawl off and to noticeably encroach upon the drift. It continues to swell, displacing timbers or breaking them, and causing no end of

Fig. 14.



trouble. Now such places are timbered with eighteen and twenty-inch round timber and somewhat loosely lagged. But few days pass before it is necessary to take out lagging and cut away the swelled ground.

In running the main tunnel of the Hidden Treasure mine at Forest Hill, in Placer county, swelling bedrock was encountered. Mr. Ross E. Browne, E. M., in his article, "The Ancient River Beds of the Forest Hill Divide" (*vide* X report, State Mineralogist of California) says of this occurrence:

"The pressure of the gravel is not great, but the swelling bedrock has been a source of trouble, driving the legs of the timber-set inward and crushing the cap. After many unsuccessful attempts to overcome this difficulty, the legs were given an increasingly greater bottom spread, until finally it was found that they remained stationary. The swelling bedrock is removed from time to time and the track adjusted. The accompanying cut shows the form of tunnel timber-set now used in bad swelling ground. Sets are first put in four feet apart, and in the course of a few months center-sets are placed between these. Timber sets on this plan have now been in place three years (1879), and are still in good condition. In 8500 feet length of tunnel there are about 4000 sets of timbers. Two men are kept constantly employed in casing and repairing the sets and adjusting the track."

Some of the drift mines on Sugar Loaf mountain, near Nevada City, Cal., that were worked twenty-five years ago, were timbered in a very peculiar and unusual manner, owing to the swelling of the bedrock. Massive timbers had been placed time and again, only to be forced out of place or broken. At last the method here described was introduced and found to answer every requirement most admirably. It was subsequently tried in some of the other mines of the neighborhood with equally satisfactory results. Once firmly placed, the timbers were never again renewed, standing until the mine was worked out.

The plan adopted was as follows: A drift of the usual form was run and heavily timbered, being well lagged overhead. The sets were placed five feet from center to center. As the work of excavating the drift proceeded, a triangular section was cut out of each side of the drift between the posts of the two adjoining sets. These two posts formed the base of a triangle, the apex being directly opposite the center of the base. At the apex a post was set, the center of which was three feet from the center line of the posts forming the base. Caps were placed reaching from the post at the apex to each of those of the base, and lagging driven in diagonally from the drift. The two sides of the triangular section opposite the base were lagged, a considerable space being left between the lagging to afford an opportunity for the soft swelling ground to force its way through the open spaces, when it is removed. These triangular spaces are continuous; that is, were cut opposite each set of the main drift. The method involved considerable extra expense in mining and timbering, but it was so infinitely superior to any plan previously tried that it was looked upon as a success mechanically and financially.

Drifts sometimes require but a few posts to support particular rock masses that threaten to fall. Where a post alone affords insufficient support, a heavy piece of plank (plate) is inserted between the top of the post and the roof.

Tunnels and shafts at times must pass through soft, running ground. Zones of rock of this description are often found lying between walls of firmer rock. The occurrence is not infrequent on the mother lode of California when the fissure is barren of quartz and filled with a mass of soft crushed foliated black slate. It is prominent in the Quaker City, Gwin, Hardenburg, Kennedy and many other mines on the lode. Such ground is nearly always wet, and the process of sinking or drifting in it is attended with expense and danger. In sinking through such ground the miners usually make an effort to push the work and pass through it as quickly as possible. When the ground is very wet and runs easily it is not always the best plan to "crowd" it. In some cases the difficulties are more easily overcome, the expense reduced and the completion of the task sooner accomplished by going slowly, allowing the ground to assume a more normal condition by cutting out and removing the material falling into or forced into the excavation. When water is troublesome in ground of this character, the better plan is to permit it to drain off. By so doing the ground sometimes becomes firmer, and, as a consequence, is more easily handled, timbers more readily placed in position, and the work carried on more satisfactorily.

Another kind of ground difficult to timber is found in some much altered rocks where talc, steatite (soapstone) and serpentine, containing much water, have to be passed through. The ground often breaks well and sometimes stands well for a time, but it is treacherous and should be promptly and substantially timbered. Rocks of this description are abundant in the great auriferous belt of California, and, as miners there well know, are usually fissured in every direction and upon exposure to the atmosphere exhibit a tendency to break up (called blocky ground). Great angular blocks and "heads" (round bowlders) drop from the roof and sides without warning. The former are often wedge-shaped and slip out from the fissured rocks when the ground had appeared firm and solid. The heads are usually hard in the center, while the outer portion is quite soft, feeling greasy to the touch. In size the masses range from an inch or two in diameter to those which weigh tons. Timber must be placed in ground like this immediately as the work progresses. The sets should not be more than 2½ feet from center to center, instead of the usual distance, 4 to 5 feet, whether it be in shaft or tunnel. Lagging, when used, must also be short.

When passing through slips or fissures, whether single or in zones, in any kind of rock, extraordinary precautions should be taken, as accident is much more likely to occur at such points than in solid, unfissured ground. Rock in the vicinity of veins is nearly always more dangerous than that at a distance from the vein.

(*To be continued.*)

Very Well Answered.

"A patent right. To charge eighteen times what a thing is worth."

Thus the term, "a patent right," is defined by *Puck*, and many people will smile over it and believe it to be an accurate definition. But, says the *American Machinist* of July 19, it is not accurate simply because no one can be compelled to pay anything whatever for a patented article. Anyone who chooses can go right on doing without the patented thing just as he did before it was invented, and he will do so unless convinced that the patented thing is worth more to him than the price asked for it.

It should not be forgotten that a real patent is simply a right to the exclusive control for a limited time of a thing actually created by the inventor—a thing in the possession of which he should be just as much protected as in the possession of a table or of a machine which he has made. A man by working two days produces a table, and when it is done it ought to be his to dispose of as he likes. If he has no use for it himself he may want to sell it, and if he does he has the privilege of charging what he likes for it, under the penalty of having it left useless on his hands if he charges more than it is worth. A man who works a year or more, perhaps, studying, experimenting and working, produces a machine which will accomplish things not before possible of accomplishment. If these things are not desirable to others then nothing will be paid for their accomplishment nor for the machine, and the inventor will be unpaid.

A Prehistoric Diamond Mine.

Exploitation, writes a correspondent of the Leeds *Mercury*, in what appears to have been a prehistoric diamond mine, recently discovered near Winburg, in the Orange Free State, has disclosed some curious and interesting circumstances. The shaft is almost perpendicular, and at the bottom, 150 feet from the surface, workings or tunnels branch off a distance of several hundred feet, much after the fashion of an English coal mine. The ground in the workings is diamondiferous, and many small gems have been found in the recovered debris. Appearances indicate that the mine had been worked secretly, and that the miners were armed, for old-fashioned spears and battle axes have been found side by side with primitive tools and skeletons of men, who must have been much above the average stature of any race of the present day: Stones, bearing inscriptions in curious characters, have also been found. It is yet a matter of conjecture as to what race worked these old diamond mines. The natives of the country have not even a legend or tradition regarding them. During the past few months there has been great activity in prospecting for new diamond mines in South Africa, and by last mail there is the official announcement by the Free State Government of the discovery, near Bloemfontein, of what appears to be a remarkably rich and promising spot. It has long been the theory of old diggers that diamonds are distributed over a wide area in South Africa.

An Index of Greatness.

We wish our Eastern friends would try to understand that it is only through the mines of the earth and through the skill shown in manipulating the metals that a nation ever becomes great. The miner is the most important citizen of any country. There is no country so barbarous, except among the most savage tribes, that the people have not a little skill in agriculture. They plant their fields, gather their crops and eat their food, but they make no advancement from age to age until they learn to go below the surface to bring up the metals, to reduce those metals and acquire the skill to put them in such forms of commerce as will command the patronage of the world. The act of doing that causes the mind to begin to expand until when the first rude sword is fashioned in a nation the possibility of a steel bridge or a steel ship is all made clear. We wish our Eastern friends to make a note of the fact that this country has advanced just as much as its people have learned to work the metals, and its further advancement will be shown as by an almost perfect indicator, through the further advancement that may be made in the same line.—Salt Lake Tribune.

The North Star on Sultan mountain, Col., has an almost phenomenal record in the respect that it has not shut down a day in eleven years. During that time it has shipped 25,000 tons of ore and 5,000 tons of concentrates, which produced 2,000,000 ounces of silver, 10,000 ounces of gold and 8,000 tons of lead. The average value of the ore in gold, silver, lead and copper is $65 a ton.

In making contracts with the iron and steel manufacturers this year, the Amalgamated Association officials have agreed that if tariff rates on sheet-iron and steel are made lower than those mentioned in the new bill as it passed the Senate, another conference is to be held and the scale question reopened.

Including "Fertilizers."

A Wall-street geutleman named Converse Clemeut, finding the midsummer dullness unprofitable, has visions of wealth, and has written to the Secretary of War for a permit to "dredge and bring ashore large quantities of black sand at various points on the coast between San Francisco aud the British possessions, particularly at Grays Harbor and points on Puget Sound, to extract valuable minerals from aud work residue into fertilizers." It is the opportuuity of his life. He wou't even need to "dredge" it, or "bring it ashore." It's ashore already, safely landed, and ean't get away. Nor will he need a permit. He will have the freedom of the entire beach from the sunny shores of Califoruia to where the free American of Alaskan descent bathes his barbarian brow in the surf that thunders on the shore of far Attou. The saud is strewn along the coast for several thousand miles, and contains gold that would make it worth even a Wall-street man's while to gather in. The trick is to separate it at a profit. A good many have tried it. The Secretary of War has referred Mr. Clement to the United States eugineers at Portland, Oregon. That he will be given permission can hardly be doubted, though he will do well not to expeet too much from the Government in the matter. His idea of working what is left after extracting the gold into fertilizers is seopy. Though the ordiuary effort has been to get the gold from the chemical embraee of the blaek sand, caring littlc for the residue, yet the idea of the Wall-street man is uot to be treated ligbtly. It may be that as brilliant a future awaits the man who can make the gold beaeh sand available for fertilizing purposes, as awaits him who can sueeessfully separate and keep separate the minute gold disseminated throngh that maguetie mass of silex.

But "art is long and time is fleeting," and it is likely that Mr. Clemeut, should he go ahead with his notion, will find an ordinary lifetime no more than sufficient to develop a portion of his auriferous scheme. The "fertilizing" part of the project is dimly remote.

THE American Medical Association had a meeting reeeutly at Oakland, at wbieh Dr. E. H. Woolsey read a paper on electro-therapeutics. The application of eleetricity to the restoration of health or the curing of disease is a favorite subject with eclectic physicians, but by reason of the increase of empiric attempts, is uot given as much discussion in a scientific way as its importance demands. Dr. Woolsey's paper was in every way au admirable one and deserves wider recognition than it appears to have received. The logical conclusion of his argument is that, while electricity is of manifest benefit in the treatment of diseasc. yet its potency renders it daugerous in the hands of even the most skillful—how much more so in the hands of the ignorant praetitioner. He detailed the processes and results of elaborate experiments covering a period of six mouths on differeut subjeets with currents of varying intensity, and while careful to avoid being positive in the expression of opinion, he made evidcnt the fact that electricity as a therapeutic agent is as capable of causing as eliminating disease. He clearly demonstrated that no one should allow a physician, "electric" or otherwise, to practice upon him with the electric current unless thorougbly satisfied that he understood what he was about, aud that it is the height of folly to permit a quack or charlatan to administer "electrieity" iu auy case of siekness or disease. Dr. Woolsey's paper may have the salutary effect of checking the destructive zeal of some "eleetric" doctors who would rush in where others fear to tread.

THERE is no war between the great Montana copper producers, uor any combination to restriet the output. It is understood, however, that a combine is on hand between the Boston companies and the Anaeonda, the amount of output to each produeer to be on the proportional basis of that previously produced, and as each is anxious for a high relative place in the proposed combine, they are now producing as much as possible.

AUSTRALIA mined 4,037,929 tons of coal last year. The supply is apparently inexhaustible.

Land Bill Passed.

Congressman Caminetti's bill iu regard to entries of land passed the House last Wednesday. As heretofore noticed, tbe intent of the bill is to save those making entries the delay, trouble and expense of appearing before United States registers and receivers by allowing entrymen to swear to tbe required affidavits before any duly authorized State or Territorial officer.

The part of the law most immediately important to miners is the section which establishes a rule of procedure in all cases where eontest arises as to whether the land in dispute is miueral or agricultural. The Secretary of the Interior and Commissioner-Gencral of the Land Offiee wrote to the House Committee commendiug tbe bill. The former wrote:

"I would suggest that tbe proviso be amended so as to read as follows: Provided that the presence of rock-bearing gold, silver, ciunabar or other valuable deposits of minerals shall be regarded as prima facie evidence that the land eontaining the same is and always has been miueral in eharacter; provided further that in investigating the character of the land, with a view to ascertaining whether it is more valuable for mineral tban agricultural purposes, evidence may be taken of the mineral diseovered or developed adjacent to such land, proof of which shall be corroborative evidence that the laud in question is mineral iu ebaracter; provided further that notbing herein contained shall affect auy pending coutest, and provided further that, except in Utah, wherever land is proven to be within a well-defined mineral belt it shall be prima facie evidence of the mineral character of such land uutil the eontrary is proved."

The bill. as passed by the House, practically complies with those suggestions.

This Will Do.

A good many inquiries are being received at this office as to the proper form for the required notice to be filed with the recorder in compliance with the provisions of the assessment suspension law recently passed by Congress. The following, it is believed, will meet the general requirements:

NOTICE.

To Whom It May Concern:—Notice is hereby given that .....the undersigned, owner..and holder.. of the..... .....miuing claim.., situated in the.....mining district, in the county of....., State of....., being desirous of taking the benefit of the Act of Congress, entitled "An Act to Amend Section 2324 of the Revised Statutes of the United States," relating to mining claims, approved July 18th, 1894, do hereby declare that....in good faith intend to hold and work said mining claim...

Witness.....hand...at....., County of....., State of....., this. .....day of....., 1894.

Signed, ...

.....

.....

Information Wanted.

TO THE EDITOR:—May I avail myself of your colnmns in order to make a request of sueb of your readers as are interested in stamp-milling to furnish me with some data regarding tbe stamp mills first ereeted in California. Tbe letter of Mr. Stanford, appearing in tbe MINING AND SCIENTIFIC PRESS of Oct. 21, '93, gives valnable information, but I desire, if possible, to obtaiu further partieulars regarding the mills whieh were first built in tbe State—more partieularly a drawing or detailed description of some pioneer plant. Respectfully,

Rico, Colorado, Aug. 1, 1894. T. A. RICKARD.

Don't be Hoggish.

We learn that there are three or four mining experts in this city at present who are in search of mining properties for companies and men of means. We presume that they are after both developed and undeveloped properites and if any can be secured reasouably they will doubtless take them. People who have claims to sell or bond and are approached by men of this kind should not expect to become Mackays or Floods in a day and demand exorbitant prices for them, but should have some eonsideration for others. A man, no matter how rich he may be, does not care to sink his fortune in the first bole in the ground he eomes across, and possessors of properties should not expect him to do so. It takes money to develop a mine as it should be developed, and any one who is lucky enough to have one and is met by these men should not hesitate in disposing of it if given an opportuuity. The quieker the people begin to realize this and give the capitalists a fair chance to open up the many properties that are undeveloped in this county the better it will be for our people and the State at large.—Nevada City Transcript.

Mexican Coal in the United States.

It is the general impression tbat no coal is mined in Mexico. This is a mistake. The fact is that Mexico sends coal to the United States. It is not sent in large quantities, but a considerable portion of the output of the mines at Sabinas, Sau Felisse, Hondo and Alamo is sent to the Uuited States over the Mexican International Railroad, and euters through the port of Piedras Negras. Nevertheless, the railroads of Mexico get much of their coal supply from England. When tbe rate of exchange is too high, they burn wood. Most of the eoal measures so far found are near the uortheru boundary, and the cost of transportation to the interior is greater than the ocean and rail cost from England. The Mexican National, a narrow gauge road from Laredo, Texas, to Mexico City, gets mueh of its supply from its own mines in the State of Neuva Leon. Tbe difficulty of mining the poor qnality of tbe product, and the lack of transportation facilities, have delayed and even stopped operation in the eoal fields of some districts. The most valuable coal mines yet found in Mexico are near San Marcial, along the Gulf of California, extending north to the Arizona line. The coal from this region is all anthracite or semi-antbracite. An English eompany was granted a eoneession of 4,000,000 acres in the district, but failing to comply with tbe agreements, the coneession was given to a Mexiean compauy.

Before the end of the present year the eoal output from the Fuente, Mexico, mines will be not less than 1,000 tons per day, tbe greater part of whieh will find a market in the Uuited States. On account of the thiekness of thc coal seam, thc cbaraeter of the roofing, which requires but little expense for supports, and the absenee of water or dangerous gases, this coal can bc mined with the eheap Mexican labor at a cost not exceeding 50 cents per ton. The coal gives good satisfaction on locomotives and stationary engines and being rich in volatile matter, will prove a valuable gas coal.

Cinnabar Mountain.

The Kennedy, Nev., *New Era* says: The early prospectors who visited this then remote portion of the world in search of silver in white quartz mistook the red oxide float to be eiunabar, never dreaming of the precious gold therein associated, and thus the towering peak which overlooks the destines of this toiling multitude bears the misnomer to this day. The "one-idea" prospector of thirty years ago has learned to look for gold. not only in glittering erystals, but in every form and hue of rock, until now they tell you "gold is wbere you find it." The cinnabar-like rock of Kennedy is gold associated with iron rust, commonly speaking, in a free state.

Apropos of this short dissertation on the mistaken ideas of years gone by,we reeall the history of the White Pine excitement, when thousands wended thier way to that great silver excitement. Nearly all the travel was through the canyon in whieh the town of Ely is situated, and half-way up the defile in the mouutain range, wagons rolled and pedestrians trod over an immense red oxide ledge that crossed the canyon and made on eaeh side into cliffs of the same character. No attention was given the rock, for it had not the characteristics of the quartz of California or Virginia City, or the ruby of Austiu. Four years ago an inquisitive prospector had a sample of tbe ore assayed, which act lead to the location of the Joanna aud Chainman group of gold mines, considered by many the most promising mines on the Coast.

As Viewed In South Dakota.

It is a remarkable fact, and one to be regretted, that the Americau people, with all their push and enterprise, should allow foreigners to open up their mountains and carry away the gold. More than one English syndicate has representatives in the United States now for the pnrpose of buying gold properties. Tbis ean, however, be accounted for by the senseless prejudice which exists in the minds of the majority of the American people against mining for preeious metals—a prejudiee not shared by any other people, and one that would be eliminated if they would only stop to investigate. If it is not eliminated, foreign syndicates will own more and more of our mines, and the gold that should enrieh the United States and its citizens, will go to Europe in dividends. To permit our precious metals to be mined aud owned by foreigners shows a lack of patriotism, as well as business sagacity, on the part of our people. It proves, though, that our Euglisb cousins appreciate a good thing, and it makes no differenee to the ever hopefnl, hardy prospector, to whom he sells the fruit of his toil.—Dakota Times.

Gold Ore Treatment at the Randt.*

The Witwatersrand gold fields are situated on one of the highest points of the South African plateau, some parts of the main reef being 5,000 ft. above sea level. It is worthy of note that on this account air compressors have to be made some 25 per cent larger than they would need to be on the coast. Johannesburg, which is only about six years old, now contains some 30,000 white inhabitants, whilst the mines employ 21,000 native laborers. It is only the discovery of coal in close proximity to the goldfields that has made the present great development of these latter possible. The cost of transport of fuel is, however, still high, owing largely to the refusal of the local railways to carry coal in bulk. It now costs about 22s per ton delivered at the gold mines. It only yields a very inferior coke, so that this article has to be imported for assaying and smelting, imported English coke being worth about £14 per ton.

The ore is different from any known elsewhere; it consists of pebbles of quartz held together by a siliceous cement, which contains in the lowest levels crystals of iron pyrites. At the surface the pyrites were oxidized and the ore was more friable, but the greater the depth attained the higher the percentage of pyrites appears to be. The gold is contained in the cementing material; it is so fine as to be scarcely ever visible to the eye, and much of it is combined with sulphides of the base metals, which latter are known as "sulphurets."

The ore when mined is hoisted up by means of head gears, which are seen dotted in all directions over the area covered by the goldfields. They are of two types. The first is a simple head gear, which delivers the ore into trucks, which are then run into the mill-building where the ore is dumped into a "grizzly" made of bars of iron, and then passes into a rock breaker, from which it falls into a hopper to go to the stamp mill. As the country is very flat, and the mills are often some distance from the mines, it was found more economical not to have the rock breaker in the mill building, but rather to place it on the head gear, and most modern head gears are so constructed. Rock breakers are either of the well-known Blake or of the Gates' or Comet type. In these the ore is broken down to about 2 in. cube.

The mills are of the usual California pattern, with self-feeders. Their weight used to be 850 to 900 lbs, and they used to have 1,200 lb. stamps, and are worked with an 8 in. drop; some of these modern mills run as fast as 92 drops per minute. In consequence of having such powerful mills, the best are able to crush 4½ to 5 tons per 24 hours per head, through a 900 mesh screen. The average for the entire goldfields for the month of December last was 3.7 tons crushed per head per 24 hours.

The batteries have amalgamated copper plates inside them, and the crushed ore is discharged on to copper tables 12 feet long and 6 feet wide, these tables being amalgamated so as to catch the gold. It is found that most of the gold is caught inside the battery, and on the first three feet of the outside copper plates. The amount of gold caught on the plates is 55 to 60 per cent, an amount which compares unfavorably with many other plates where the percentage is said to be 80 to 90. The amalgam is collected and is cleaned in pans and then heated in retorts, when the mercury is driven off and recondensed; the spongy gold so obtained is then melted. The loss of mercury in the entire treatment is about three-fourths ounce per ton of ore; at the Robinson mine it is 0.65 ounce. The melted gold is usually 800 to 825 fine. It contains silver, lead, copper and other base metals.

After the pulp has passed over the plates it is run into concentrators, which extract the sulphurets. There are various kinds of concentrators used, but the Frue vanner is the most popular. The percentage of concentrates obtained is about 3, and these sulphurets assay from 5 to 8 ounces of gold to the ton. Most of the mines sell their concentrates to one of the two chlorination works on these gold fields, the price given being 90 per cent of the assay value, less £4 per ton. In the chlorination process 95 per cent of the gold contents of the ore is extracted. This process is, however, only suitable for rich material; it is not, like the cyanide process, suitable for poor-grade stuff, such as are the tailings.

The concentrates are roasted in reverberatory furnaces, this being the most important part of the whole operation. The roasted stuff is then damped till it contains six per cent of moisture, and charged into vats furnished with covers fitting gas-tight. Chlorine gas is then passed upwards through the roasted ore; this combines with the gold, forming soluble chloride of gold, which is then washed out, the solution being filtered off and the gold precipitated from the solution by means of sulphate of iron, which is made on the spot. The process is costly, owing to the high price of sulphuric acid, which costs £25 per ton. The consumption of acid is 300 to 400 tons per annum.

After the pulp leaves the concentrators it is run into dams, where the tailings are allowed to settle. These tailings constitute about sixty per cent of the ore, the remaining forty per cent forming the slimes, which are run to waste and are totally lost. The tailings contain six dwt. to seven dwt. of gold to the ton, and the slimes four dwt. to five dwt. The tailings are charged by hand into huge vats, the largest holding 400 tons. Then a solution of cyanide of potassium is allowed to flow through them. Some mines employ a system of repeated percolations of this solution, while others object to it. A strong and a weak solution are employed, the first containing from 0.6 to 0.3 per cent, and the second from 0.3 to 0.1 per cent of cyanide. The whole tendency recently is to work with very weak solutions. Each solution is allowed to act from between twelve and eighteen hours, and is then run off into zinc boxes, where the gold is thrown down by means of zinc shavings.

Theoretically, 100 ozs. of gold should be dissolved by 4.3 lbs. of cyanide, but in practice 300 lbs. of cyanide are required. Some mines consume as much as 2 lbs. of potassic cyanide for each ton of ore treated. The zinc precipitates the gold from the solution, forming a mass of so-called zinc residues, which contains a very great deal of zinc and other impurities. The zinc residues are calcined, and then melted with a mixture of carbonate of soda, borax and fluorspar, when gold is obtained 720 to 750 fine, the principal impurity being lead. There appears to be no difficulty in refining this gold, which is very brittle. The average extraction of gold by the above process in 1893 was 14 dwt. per ton, the assay value being about 15 dwt. 8 gr. per ton.

* Abstract of paper by Mr. H. De Mosenthal on "The Treatment of Gold Ore at the Witwatersrand Gold Fields," read by the Chemical Society (London).

To Tap the Central Heat of the Earth.

Engineering Magazine says that the ingenious idea of obtaining an unlimited supply of heat for the generation of power by boring a deep hole and so tapping the central heat of the earth, assuming the correctness of theory of the existence of a central heat, has recently had some additional data furnished upon which to base further calculations. The deep bore hole at Wheeling, W. Va., shows a temperature of 135 deg. F. at a depth of 5,000 feet, the increase in temperature during the lower part of the bore being about 1 deg. for every 75 feet of depth. This was a more rapid increase than appeared at less depths; but assuming this rate to be uniformly continued, it would require a depth of about 3½ miles to obtain a temperature equal to that of steam at 100 pounds pressure. Just what results might be obtained in volcanic countries does not appear, but surely in such regions steam ought to be pronounceable by natural sources of heat much nearer the surface. After setting Niagara at work it may be next in order to impress into service either the geysers of the Yellowstone or even Vesuvius himself, and long before the available coal supply is exhausted we may be drawing from natural sources of energy beside which the already paling brilliancy of natural gas shall be as the flickering tallow candle of past days.

The Fascination of Prospecting.

Prospecting is a fever—a mania—which grows on one as does the habit of gambling, which it resembles, both being games of chance. The "knack at hoping" and the excitement induced by the hope—keeps alive many men to-day whose hair and beard are as white as the snow on the mountains. Once a prospector, always a prospector, unless a strike is made that will keep the lucky one in affluence the balance of his days. Then, ofttimes the riches from one mine but serve to dig unprofitable holes in the ground, of which the only product is hope. And then one lucky strike—one man made rich in a few months! How many men does it cause to shoulder a pick and shovel, tramp all day over the mountains, sleep on the hard cold ground at night and eke out a precarious existence as a prospector? It is seldom that the man who discovers the mine makes the money. It is the man with the silver and gold in his pocket who comes afterward. In ninety-nine cases out of one hundred the man who makes the money is not the man who "hoofed" it into a new mining country but the man who, a few years later, rides into town in a palace car. Few prospectors get rich—fewer save their riches. The prospector's life is not an easy one—'tis simply a happy one.—Ex.

Reduction in Salaries.

According to the Carson *Tribune* the following reductions have been made in the salaries of mint officials:

Superintendent, from $3000 to $2500.
Melter and refiner, from $2500 to $2000.
Assayer, from $2500 to $2000.
Assistant assayer, from $2000 to $1500.
Assistant melter and refiner, from $2000 to $1500.
Chief clerk, from $2250 to $1800.
Cashier $2000. No reduction.
Bookkeeper, from $2000 to $1500.
Weigh clerk, from $2000 to $1500.
Appropriation for labor from $50,000 to $15,000.
Appropriation for incidentals and contingent expenses, from $25,000 to $7500.

Patent--Uncompleted Invention.

The Court of Appeals of the District of Columbia held, in the recent case of Coffee et al. vs. Guerrant, reported in the Washington *Law Reporter*, that where from the date of the first application until the date of the application for an invention in its final form the machine on which both applications were based was preserved and in use, either partly or wholly dismantled or entirely assembled for the purpose of obtaining a patent, and with a view to its mechanical perfection for the actual commercial use, such machine did not present the case of a dismantled and abandoned experiment recalled to memory by the successful effort of a later inventor. The court said that "a perfect invention does not necessarily mean a perfectly constructed machine, but one so constructed as to embody all the essential elements of the invention in a form that would make them practical and operative, so as to accomplish the result in a reasonably practical way." The machine involved in this case was a tobacco stemming machine which was set up in a tobacco factory at Danville, Va., a great tobacco manufacturing place. It was operated by hand, and also by steam power, at different times within a short period, and in the presence of a number of people. When fed with the tobacco leaves, prepared for stemming, it performed fairly satisfactory work. But few leaves passed the blades without having the stems properly removed. The court took the view from the evidence that the machine was something more than an unsuccessful experiment, and that it was in fact a reasonably successful reduction of the invention to practice.

Patent Office Records--Evidence.

The Circuit Court of Appeals for the Second Circuit held, in the recent case of The Mayor of New York City et al. vs. American Cable Railway Company, that certified copies of the Patent Office record of instruments purporting to be assignments are not prima facie proof of the execution or genuineness of the instruments. The court (per Wallace, C. J.) said: "The assignment of a patent is not a public document, but is merely a private writing. There is no statutory provisions requiring it to be recorded in the Patent Office. Section 4898 of the Revised Statutes permits this to be done for the protection of the assignee against subsequent bona fide purchaser or mortagagee. The section does not make the recorded instrument evidence, does not require the assignment to be executed in the presence of any public officer, or to be acknowledged or authenticated in any way before recording, or does not provide or contemplate that it shall remain subsequently in the custody of the office. It devolves upon the Patent Office merely the clerical duty of recording any instrument which purports to be the assignment of a patent. We are aware of no principle which gives to such a record the effect of primary evidence, or prima facie proof of the execution of the genuineness of the original document."

Is Not Buried.

Nothing is useless nowadays—not even a defunct pauper. The poorhouse guardians know better than to act recklessly: often the panper is the possessor of a set of artificial teeth which contains a good deal of gold—last relic of more prosperous times—and in the interest of the ratepayers the precious metal must be secured and turned into £ s. d. Often, too, they are the owners of rings or tiny trinkets, not pawnable, but still containing as much auriferous value as not a few modern gold mines. These have to be collected and also converted into cash by means of a melting pot. In the Holborn Union the melting process takes place once a year, and has just been accomplished for the present season. The jewelry dealt with is what is found on paupers who died friendless and unclaimed in its various establishments. This week rings, chains, brooches and trinkets have been melted down, and produced a bar of gold, estimated as 11 carat, and worth about £40. A good proportion of it was got from the plates of artificial teeth. Mr. Walton said that on one set of artificial teeth there was at least £4 worth of gold. The proceeds are paid into the common exchequer of the union.—English Ex.

Total Production of Gold and Silver.

M. Edmond Thery, director of the Economiste Europeen, "states that the whole production of all the mines in the world, from the discovery of America in 1492 to the year 1892, inclusive, amounts to 233,950 tons of silver, representing, at the present nominal value of that metal, 51,936,000,000 francs, or £2,077,440,000, and 12,358,932 kilograms of gold, representing 42,564,000,000 francs, or £1,702,460,000, making a total of 94,500,000,000 francs, or £3,780,000,000. The total quantity of gold would form a cube of 8.62 meters side, and a base of 74.3 square meters area. With the same base the 22,280 cubic meters of silver already extracted would form a solid column of 300 meters height, exactly equal to that of the Eiffel tower."

Scientific Progress.

The Storage Battery of the Air.

The air will stand a strain of abont 9,600 grains per sqnare foot before breaking. That is, the flash will occnr when the eleetrieal pull amouuts to this, 1.37 pounds per square foot. For the energy of a cubic mile of strained air just before the flash we have; then, about 70,000,000 foot tons. The average thunder head or cumnlo-nimbus cloud is not a mile high, however. For a small cloud, one hundred yards square, and distant only a quarter of a mile, we wonld get about 300 horse power. Now a flash even a quarter of a mile means a potential of many million volts. We cannot at present measure this directly, but we can determine the potential of the air within certain limits on any day, thunderstorm or no thunderstorm. In 1885, at Blne Hill Observatory, and in subseqnent years, says A. M'Adie in *Harper's Magazine*, we measured the potential of the air with insnlated water-dropping eollectors, after the methods of Thompson (now Kelvin) and Mascart. The top of the hill is 600 feet above the surrounding country; bnt with Franklin's idea of reaching out a little farther than the earth, I ventnred to use at times a large kite, tin-foiled, and for kite string some 500 feet of hemp fish line wrapped abont with fine nncovered copper wire. Dnring thunderstorms the sparkling and sizzling at the electrometer and of the kite string were incessant and startling. And even on cloudless days I fonnd it possible to draw sparks, reading at the same time on the electrometer from minute to minnte the electrification of the air in volts. In 1886 and 1887, in some investigations carried on by the Chief Signal Officer, and more immediately under the snpervision of Professor Mendenhall, I experimented at the top of the Washington Monument, at that time the highest edifice in the world. The investigation continued many months, but perhaps days on which severe thnnderstorms occnrred were most impressive.

It being beyond dispnte, then, that high potentials can be obtained from the air. the question naturally ensuing is, Can we not use them? With three or four sparks as small as those mentioned above, a large fruit jar can be cleared of smoke with which it has previously been filled. Perhaps nature repeats this on a large scale with lightning and clarifies a foul dnst-laden atmosphere with these great sparks. It may be, too, that these flashes are all needed, and to attempt to divert them may be unwise. Be that as it may, we are living in an age of "step-np" and "step-down" transformers; an age when, for the first time in centnries, we are perilonsly near duplicating lightning. Until recently we stndied lightning only in miniatnre. Prof. Elihu Thomson was kind enough to show me in his Lynn laboratory, two summers ago, some of his larger home-made lightning Indeed, potentials of 100,000 volts are less rare to-day than potentials of 5,000 volts were five years ago. All who saw the Thomson aud Tesla exhibits at the Electrical building, Chicago, will easily believe that it is within our power to tnrn the fleeting high-potential lightning into a cnrrent of lower potential and nse it.

Professor Trowbridge, of Harvard University, in a discussion of some photographic negatives, shows that "the discharge follows exactly the same path in air for three hnndred thousandths of a second," and adds that "it is probable that an ordinary discharge of lightning of a few hnndred feet in length could light for an instant many thonsand incandescent lamps if it were properly transfromed by means of a step-down transformer." The eye alone cannot give a complete history of the myriad minor flashes dnring a thnnderstorm. The charred, though to ns intensely brilliant, crack in the air which we call lightning is bnt a great splash in the ether ocean. The waves and ripples come tumbling along in all directions, spreading rapidly, aye, very rapidly, nearly 200,000 miles per second. Given a proper resonator, and the waves will do work. If my reader keep every sense on the alert, he may happen on some strange illnstration of work done by lightning, now all nnsuspected. In the tinkliug of the telephone bell, the blinking of an incandescent lamp, the melting of a fnse, or the tiny spark from a gas pipe or loose wire, is the constant proof that there are more things going on between heaven and earth duriug a thunderstorm than most of ns dream of in our philosophy.

A Few Telephone Figures.

There are now in operation in the United States alone more than half a million miles of telephone line, bringing into speaking relations over 250,000 telephonic snbscribers, and employing in daily service over 600,000 telephones, by means of which 600,000,000 messages are transmitted annually. These figures, given on the anthority of Mr. Arthur V. Abbott of the Chicago Telephone Company, most graphically portray the remarkable proportions which Prof. Bell's invention has assumed. The earliest application of the telephone necessitated a wire extending from each station to every other one with whieh communication was desired. How practicable a method this is, however, for covering a territory of any magnitnde can be seen without much difficnlty. In both New York and Chicago, for example, about 10,000 subscribers have telephonic commuuication. The most compact system of nndergrond circnits needs abont four sqnare inches for every 100 lines, so that, to nnite each of the 10,000 snbscribers with the remaining 9999 would require a space of more than a yard sqnare simply to contain the necessary conductors. No present city street could afford the required room for the snbways. If communication were thns attempted, each subscriber, according to Mr. Abbott's figures, wonld require nearly 200 miles of cable, and should the distribntion be nndertaken by means of aeriel wires, pole lines 1000 feet high would be reqnired to accommodate the necessary circnits. It is to the impossible complexity of such a system, which became apparent even in the earliest telephonic days, that the telephone central station and the telephone switchboard owe their origin and development, aecomplishing to-day resnlts whose convenience and importance are all bnt lost sight of in the bnsy whirl of existence. and can perhaps be best appreciated only by comparison with the meagre telephone facilities of a dozen years ago.—Cassier's Magazine for August.

Paper Telegraph Poles.

Paper telegraph poles are the latest development of the art of making paper nseful. These poles are made of paper pulp, in which borax, tallow, etc., are mixed in small qnantities. The pulp is cast in a mold, with a core in the center, forming a hollow rod of the desired length, the cross-pieces being held by the key-shaped wooden pieces driven in on either side of the pole. The paper poles are said to be lighter and stronger than those of wood, and to be nnaffected by sun, rain, dampness, or any of the other canses which shorten the life of a wooden pole.

Electricity Underground.

Electricity is now used in 300 mines in the United States, and proprietors of perhaps as many others are considering its ntilization. It presents a system of the greatest simplicity, completeness and flexibility, permitting power from one sonrce to be distribnted in nnits of any desired size and for any purpose to the places where it can be employed to the greatest advantage, thereby secnring the minimum cousumption of power and expenditure of labor. With electricity there is neither friction, heat nor condensation. There is no leakage nor loss of power when not in nse, whieh espeeially recommends it for intermittent work.

The *Electrical Review* says the Railway Ammonia Motor Company has recently had bnilt at the works of the De La Vergne Refrigerating Machine Company, in New York, a motor car upon its system, and a trial took place at the Da La Vergne works recently. The car is abont the size of an ordinary horse or trolley car, and abont one-half of its space is occnpied by the motor. Anhydrous ammonia in this car is charged in a reservoir, which is snrrounded by a tank filled with hot water. From the reservoir it passes into the cylinder, where it acts on the piston precisely as steam does. The exhaust from the cylinder is conveyed into the water tank. where the ammonia is condensed, and can afterward be recovered, the inventors claim, with very small loss. In the trial the reservoir was charged until the pressure was about 150 pounds, and the car was rnn about a mile backward and forward before the pressure ran down to 100 ponnds.

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Mechanical Progress.

Increasing Use of Oil as a Fuel.

According to *Indian Engineering*, the utilization of the heat force of oil as a fuel is increasing, the reduced price of petroleum, and the cheap carriage of it in tank steamers instead of barrels, greatly stimulating its use. As fuel for steam boilers at sea there are certain economies in the labor of stoking which encourages its use, but the choice depends on variable circumstances, such as the relative cost of oil and coal at any particular place, the certainty of finding a store of oil ready at ports of call, and finally, in the absence of risk in the storage and use of oil. At present it is only at places such as the Caspian sea, or on the Volga, where oil is cheap and coal very dear, that boilers are made for oil fuel exclusively.

The explosive force of vaporized oil, without the inconvenience and waste of steam boilers, is more immediately interesting to engineers. During the last twoor three years oil engines have been greatly improved, and are taking a more important position among motors which may be relied upon. Except in countries where import duties are imposed, the cost of petroleum has been brought down to a low price, and as the consumption in an oil engine only ranges from one-sixth of a gallon per effective horse power per hour, the oil motors are cheap as well as convenient. Not only as fixed machine, but as motors for lauuches and tram cars, oil engines are likely in the future to compete with steam and electric engines.

Making Tubes From Wood Pulp.

Metal may be broken up in pieces and melted together, and thus be as solid as ever. At first it does not seem as if wood could be treated in a similar manner with similar results; but such material, being ground as if for making paper, may be worked up into tubes which, when treated with asphaltum and other chemicals, are harder than the original spruce and poplar used in making them. The pulp is first wouud around a mold, which is removed when enough of the water has drained off; and the tube is then laid on other supports until thoroughly dry. After undergoing the other processes already referred to, it is trimmed and shaved at the ends, for fitting. Such pipes, with a diameter anywhere from one and one-half to twelve inches, may be made proof not only against water, but also acids aud alkalies. They also offer high resistance to electrieity, and therefore make admirable eonduits for telephone and light wires. The bursting streugth is from 150 to 250 pounds to the square inch. Of course they are combustible; but they can stand a temperature of 150 degrees without injury.

Greater Accuracy in Telephony.

Following the example set in Europe, several street railroad compauies in this country have begun to use the telephone instead of the telegraph for communicating between the divisiou superintendent and the stations on the line. The long-distance telephone is also being used for exeeutive business between railroad offieials in large cities. At a eonventiou of railway telegraph superintendeuts in Detroit a few weeks ago there was a discussion of the change. The principal objectiou in most minds grows out of the errors due to similarity iu sound between words of very different meaning. To obviate this it was suggested that telephonic operators in sendiug a message spell it out, letter by letter, instead of repeating it word by word, and, in receiving, to verify it in the same mauner. This, while not elimiuating all possible chance of mistake, would greatly reduce it, and yet take no more time. The ouly other objection of consequence is that the telephoue leaves no record. But this argument is met with the auswer that for at least half the business of a railroad telegraph line no record is required; and the registering apparatus of telegraphy has been out of use in this country for years, anyhow. It is alleged, moreover, that there is a distinct economy in the use of the telephone, as it requires less battery or dynamo current to work it.

Relative Strenght of Metal and Timber.

Prof. Robert H. Thurston, in a recent article discusses various materials in which comparisons of interest are made. At the outset he gives the following generally accepted figures: Cast iron weighs 444 lb. to the cubic foot and a 1 in. square bar will sustain a weight of 16,500 lb., bronze, weight 525 lbs., tenacity 36,000; wrought iron, weight 480, tenacity 50,000; hard "struck" steel, weight 490, tenacity 78,000; aluminum, weight 168, tenacity 26,000. We are accustomed to think of metals as being stronger than wood, and so they are, generally speaking, if only pieces of the same size be tested. But let equal weight of the two materials compared, and it will then be found that several varieties of wood will prove stouter than ordinary steel. A bar of pine just as heavy as a bar of steel an inch square will hold up 125,000 lb.; the best ash 175,000; and some hemloek 200,000 lb. Wood is bulky. It occupies 10 or 12 times the space of steel. The best steel castings made for the U. S. Navy have a tenaeity of 65,000 to 75,000 lb., to the square inch. Whitworth, by solidifying such castings uuder great pressure, got a tensile strength of 80,000 to 150,000 lb. By "drop-forging" no doubt this may soon be paralleled. We now get still better strength in small pieces. The best tool steel, from ingots, is far superior to steel castings and forgings in this respect, aud fiue steel wires and ribbons give a tenacity of 300,000 lb. to the square inch of cross section. Ordiuary aluminum is oue-third as heavy as steel, and a bar of the former, with a cross seetion of 3 square inches, would hold up 78,000 lb., and that is as much as 1 ineh of good steel would do. Various alloys have been made in whieh aluminum is the chief ingredieut, securing iuereased streugth without materially addiug to the weight. But Professor Thurston does not regard any of them uor any of the numerous bronzes as well adapted as steel. Still at the time of this writing he may not have seen the recent statement of Alfred E. Huut, president of the Pittsburg Reduction Company, that, by adding a low perceutage of "hardening iugredients" and rolling, his works could produce alumiuum plate with a teuaeity of 40,000 to 45,000 lb., without materially affecting the weight. This would give a tensile strength, in a bar weighing as much as steel 1 in. square, of about 130,000 lb. It has been elsewhere stated, not over Mr. Hunt's signature, that his company produced alumiuum with a strength of 60,000 lb. to the ineh, which would be equivalent to steel giving a tenaeity of 175,000 lb.

ACCORDING to the Philadelphia *Times*, au American got a silver dollar in trade at Honkow, and attempted to pass it at the bank there. He was told it was not good, and upon his questioning the matter the Chinese cashier sent for a candle and lit it. He then held the coin over it, and lo! in a moment it began to melt. The sides fell off and in the center there was a piece of eopper. The counterfeiters had split a genuine coin and had hollowed out the two pieces on the inside so that the copper could be fitted into them. They were then patched together so neatly that ouly the experienced ear of the Chinese shroff could detect the fraud.

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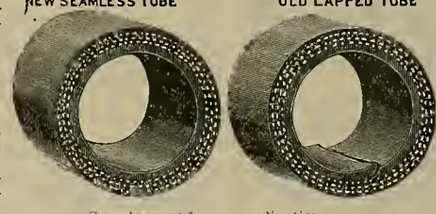

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GENERAL MINING NEWS.—*Ledger:* Frederic F. Chisholm, of the Extension Mining Company, has men at work driving a prospecting tunnel on the property of his company in Plymouth.

The Clyde mine, the property of Aitken & Stevich, has hen sold to D. Jones as trustee for some Pennsylvania people. The price paid for the mine was $25,000.

Hicks, Chase & Freese of Pine Grove are mining on Clinton Bar, with good prospects. They are working thirteen men, using derricks to elevate the gravel to a point at which they can utilize water.

The Vandament claim in Pine Grove, by a mill test of fifty tons, has proved to contain $13 rock. Charles Denning is superintending the work for John Denning and Thomas Day of San Francisco.

The Gwin Mine Development Co. has received the machinery for the new hoist. They have a large force of men at work and the intention is to have the hoist completed by the 15th inst. The shaft is about a hundred feet deep now. C. O. Mitchell of Sutter Creek has commenced laying the pipe from the tank reservoir to the works. They have about 380 feet fall from the reservoir to the works.

I. R. Bearce, who, in company with C. Marelia, has been working the Amador View mine in Pioneer district, recently uncovered a fourteen-inch ledge on that property near the surface. They are going to continue taking out the rock and send it to a mill in the neighborhood to he crushed. The quartz will assay in the neighborhood of $100 per ton.

The New London mine, near Plymouth, which was honded by its owners, Messrs. Haynes, Matthews and Greenhayden to a promotor in the interests of an English company over a year ago, has been taken and the purchase price of $15,000 paid over. The superintendent for the present company, N. J. Coleman, is now working four-hour shifts, taking out the water preparatory to repairing and developing the property. They have purchased the hoist and rock-breaker of the Pacific mine and will move them to the New London as soon as possible.

MINE SOLD.—The Mahoney or Hector mine has been sold by E. C. Voorhees to the Wildman Mining Company.

THE GOOD HOPE MINE.—*Dispatch:* The Good Hope is located on the mother lode. The mine was incorporated several years ago with the intent of working it with local capital, hut there became a hitch with regard to how and by whom it should be managed, and the plan again came to a standstill. The corporation organized with 50,000 shares at the par value of $10 per share, 49,000 shares remaining in the hands of Chas. Peters, the original owner. He has had handsome offers for the property, hut would not drop a dollar from the high price he held it to be worth. R. H. Browning of El Dorado Springs, Mo., has bought 24,500 shares for $15,000. The remaining shares will he placed on the market. The old shaft of the mine, which was sunk twenty years ago to a depth of ahout 110 feet on the ledge, and shows excellent ore, which widened and grew richer as it went down, and at the hottom the vein is six feet wide of heavily sulphuretted ore, yielded, hy actual milling test of 20 tons, over $6 per ton in free gold alone. A drift has heen run at the 70-foot level a distance of 136 feet south, showing good pay rock with excellent gangue and well-defined walls the entire distance. A drift north at the same level is in forty feet in pay ledge matter all the way.

Butte.

BUTTE COUNTY MINES.—*Mercury:* At the Stow mine at Forbestown work has hegun on a tunnel a mile and a half helow the mine. It is proposed to tap the lowest level of the mine, affording an easy method of taking out the ore. Should the tunnel disclose as large a hody of ore as is expected, the mill will he moved down the canyon and largely increased.

The Shakspeare mill is now running on a sample lot of ore from the James Carlisle ledge on the South Feather. Mr. Carlisle, it is stated hy experts, has one of the largest and richest ledges ever discovered in the county. It is located in a deep canyon, where to huild a road would require a great outlay of money. Consequently, before going to this expense, and the additional one of huilding a mill, he desires to thoroughly sample the ore. An excellent trail has heen huilt from Forhestown to the mine, and over this Mr. Carlisle is now running a pack train of ten mules, transporting the ore in packs to the Shakespeare mill, where it is worked. The pack-train makes two trips a day, and will prohably carry two tons of ore. Upon the result of this test depends the erection of a mill.

Geo. Finch has recently discovered a hig ledge near Carlisle's, which he is engaged in developing. It prospects highly, and the ore hody is immense.

The Phœnix mine at Hurleton has resumed operations. The last cleanup at the mill resulted in hullion to the amount of over $8000, an average of $11 per ton on the ore crushed, hesides the sulphurets, which are now in process of reduction.

The last cleanup of the Golden Summit mine resulted in over $3000, which, for the amount of ore crushed, shows a high average, and the amount of rock in sight justified the statement that it is a most valuable property.

At Magalia N. D. Rideout is engaged in developing the famous Pershhaker mine. Boarding and lodging houses have been erected for the workingmen, and a force is engaged under J. C. Campbell, as superintendent, in sinking the shaft. Eastern capitalists are also looking at the Aurora mine, and active operations will he commenced shortly.

For some time the work of draiuing the Golden Feather River mine, ahove Oroville, has heen going on, and the elevators have ahout accomplished their work. Mining will shortly hegin.

El Dorado.

THE TAYLOR OR IDLEWILD MINE.—*Courier:* The Taylor mine (Idlewild), located three miles to southwest of Georgetown, contains not only the hest equipped forty-stamp mill and hoisting works in this and adjoining counties, hut one of the best in California. The entire works are lighted by electricity. The main shaft has reached a depth of over 600 feet. The water power is supplied by the California Water Co., operating the Pelton wheels under 300 or more feet pressure. The pulp, after passing heyond the concentrators, is so thoroughly rohbed of its gold that assays show only a perceptihle per cent.

Nevada.

IN THE HECLA.—Grass Valley *Telegraph:* Rock taken from the footwall of the Hecla (Kate Hays) mine at a depth of 125 feet shows well in free gold. The Hecla is situated in the vicinity of the W. Y. O. D., Pennsylvania and Rose Hill mines. It was worked in 1863 and the rock paid from $35 to $45 per ton without the sulphurets.

MILL STARTED.—*Tidings:* The new mill of the Gold Flat mine, or at least five stamps of it, started up Thursday and worked satisfactorily. There are about 300 tons of quartz on the dump to be crushed, and it is expected that this will yield a fair amount of the yellow metal.

MINING NOTES.—*Transcript:* The company now owning the Eagle Bird mine, in Washington district, have changed the name of the mine to the Oak Tree. It has of late been known as the Diamond D. The present company is having the mill put in thorough repair.

Cole & Williamson have arranged to bond their mine to Haywards & Co. of San Francisco. They have a ledge sixty feet wide, and the general character of the quartz is good. It is believed that if proper machinery was put up, so as to work the mine on a large scale, and at the same time economically, it would prove a hig investment.

The Spanish mine owners have men at work prospecting below the mill, with a view of moving the mill, as all the ground above has been worked out.

In Eureka district, D. Moore of Washington, C. D. Eastin of Eureka, and C. Bonnemort of Oakland are meeting with encouraging results at their mine. They have a good ledge of fine rock, and the ten-stamp mill is kept running steadily. The mine is situated below the National, toward the Middle Yuha river, and ahout four miles from the town of Graniteville.

NEW COPPER MINES.—Preparations are being made at Spenceville, this county, says the *Tidings*, to actively work the copper mines of that district. The mining claims formerly owned hy C. C. Bittner have been purchased hy a San Francisco company which has incorporated under the name of the Mineral Hill Gold, Silver and Copper Mining Company, and has purchased machinery for melting the ore. The ore will average from 8 to 10 per cent copper and varies in richness in gold and silver, which will prohably insure its successful operation. The company has contracted with J. W. Jackson for 500 tons of ore. The company is at present taking out ore and expects to have 700 tons ready for the furnace as soon as it is completed. The furnace has a daily capacity of 40 tons, and we can soon expect to see great activity in mining in this old camp. Tunnels are being run from the north fork of Dry creek, which will tap the several veins ahout 400 feet vertical and insure ahout 500 feet of backs. One of the tunnels will be over 1000 feet in length when completed.

Placer.

THE OSBORN-GAYLORD MINE.—*Herald:* Messrs. Osborn, Gaylord and Haskill have consolidated their mining claims on Rattlesnake and incorporated. Supt. Gaylord has had eight men working, and the tunnel is in about 500 feet, and the gravel (of a cement formation) is uncovered, ready for milling. Mr. Gaylord has heen in San Francisco this week, making arrangements for putting up a mill immediately. The prospect is good, and there is enough gravel uncovered to keep the mill running a year.

Siskiyou.

MINING NOTES.—*Union:* The Fernandez claim, on Cherry creek, is reported as paying exceedingly rich, as high as 100 ounces a week having heen realized.

The Spengler Bros. claim, at mouth of Humbug creek, is now paying handsomely, a rich bed of gravel having been found in the channel.

At the Beehe Bar mine, in Virginia Bar district, Klamath river, the work of hoisting pay gravel has heen commenced, and, although not yielding much pay yet, it is expected good returns will be secured when nearer the hottom of the channel, where the gold generally sinks down to the hedrock.

Murphy, Freeland & Co. have a fine ledge on Salmon river, which measures four feet in width and pays exceedingly rich.

The Hungry Hill quartz ledge on Know Nothing creek, in the Salmon river section, is a valuahle mining property. The mine was honded lately for $100,000, and the owners were delighted when the holders of the hond failed to close their bargain. The quartz from this ledge pays several hundred dollars per ton, and the property could not be purchased at present for $500,000.

Four prospectors have recently discovered a very valuahle six-foot lead of superior hituminous coal, not far from Sisson, which is likely to prove a honanza for the discoverers. It was tested at Sisson in a hlacksmith shop for heating iron, and found to he excellent, besides good for all other purposes. If, on further development, the lead continues to prove extensive, there will he no trouhle ahout huilding a hranch railroad to the locality, as good coal will always find a ready market at paying prices, and give employment to numerous men. It is thought that extensive coal leads exist in various portions of this county, and that coal mining may eventually hecome a leading industry.

The quartz mines on Humhug are now yielding handsomely, since the men are able to get down in the shafts without so much trouble from water, hy reason of the claims drying out under the influence of hot weather.

THE BLUE GRAVEL MINE.—*Journal:* The shaft on the Blue Gravel drift claim, 1¼ miles south of Yreka, at a depth of 110 feet encountered a gravel channel 200 feet wide. The owners have hreasted out ahout 300 feet in length hy from 60 to 70 feet in width of gravel, and realized $35,000 in gold. During the week preceding the date of the recent tie-up $1330 was taken out, which was the largest weekly cleanup in the history of the mine. A tunnel is heing run south from the shaft over raised rock, in the expectation of encountering at a distance of ahout 200 feet another or division chaunel.

NEVADA.

DE LAMAR'S BONANZAS.—James Healy, foreman of the properties of the De Lamar Gold Mining Company, Nevada, tells the *Tribune* that the Monitor, Jim Crow and others embraced in the De Lamar group, are the higgest things he has ever seen in the way of exclusively gold propositions. The properties, he reports, have been opened up through six tunnels, four of which have been driven since May last and entailed 2000 feet of development, which gives them a depth of 400 feet on the vein or 700 feet helow its apex. The most important disclosures in this period of development were in the tunnels on the Monitor, where 16 feet of ore in two distinct places in the vein shows a general average of $100 per ton, the balance of 40 feet between walls returning not less thau $15 a tou.

How to handle these ore hodies is the problem the company is undertaking to master. They must have water, and drills are now horing at a depth of 300 feet, while near a spring the company is sinking a shaft, six hy eight feet in the clear, in the hope of striking the underground watercourse from which the springs are fed.

At the same time a force of men is clearing the way for a mill. A tramway for the economical delivery of the ores is being constructed, and everything is being put in shape for the continuance of the production of gold from the honanzas.

Mr. Healy says he has satisfied himself that the property is on the same helt as that of the famous Raymond & Ely at Pioche which was worked to a depth of 1800 feet and is yet producing, and that it will be shown to contain riches just as permanent.

A telephone line has recently heen constructed hetween Pioche and the mine, 50 miles distant.

PERFECTING THE CYANIDE PROCESS.—Lovelock *New Era:* Not a word reaches the columns of the Nevada newspapers of an industry within its horders which in mining circles is of world-wide importance. William Willis hegan experimenting in Tuscarora with the cyanide process in extraction of precious metals from ores of that district, hut for some time was unsuccessful. The first discovery he made was to detect the escape of the precipitates from the zinc, wherehy, after forming in light flakes, they were washed into the tailings. This fault was remedied hy regulating the flow of the solution through the zinc hoxes, the flows having heen too strong. After many months of patient lahor, he succeeded in arriving at a formula, and arranging his plant so as to save 98 per cent of the assay value of the gold and silver in the rock he treats, and has caught 99½ per cent. To he able to extract the silver is a secret process known only to Mr. Willis. Every few weeks for months past he has shipped a bar of hullion, a fitting resultant of his wisdom and patience.

Washoe District.

ON THE COMSTOCK.—The following is condensed from superintendents' weekly reports:

In stoping out between the south drifts Nos. 2 and 3 in the ore hody recently found on the 1650 level of Con. Cal.-Virginia, on the west side and to the south and upward, extracted during the week 350 carloads of ore—about 347 tons—the average assay value of which, per mine car samples, was $57.37 per ton. The faces of the ore body in those directions continue to look well. Twenty-two feet below the south drift, No. 3, started at the end of the west crosscut on the 1700 level, has heen advanced 22 feet; total length, 36 feet. The last ten feet is in ore which will average $50 per ton, and the face of the drift is in ore which will average $60 per ton hy assay.

The south drift from the crosscut run west from the hottom of the winze, which was sunk 28 feet on the east side of the main drift on the 1000 level, 280 feet south from the shaft station, has heen extended 36 feet; total length, 48 feet, continuing in porphyry and quartz formation carrying a low assay value. The west crosscut started from the main drift, 345 feet south from the shaft station, has been advanced 30 feet; total length, 130 feet, continuing in porphyry and quartz formation of low value. Some repairs have heen made in the main drift. Have continued repairs in the Con. Virginia shaft between the 1300 and 1400 level stations in order to place pipes therein to carry off the water flowing from the workings of the West Con. Virginia and California Company.

Have shipped to the Morgan mill during the week 325 tons and 1470 pounds of ore, the average assay value of which, per railroad car samples, was $60.59 per ton. The average assay value per hattery samples of all the ore worked at that mill during the week—135 tons—was $68.47 per ton.

The Union Con. and the Sierra Nevada joint north drift on 900 level is in hard porphyry. The west crosscut on 1465 level of Mexican is in porphyry, showing fine lines of quartz. The east crosscut on 1465 level of Ophir is in vein porphyry, with hunches and lines of quartz. The face in the old workings of the west crossent started from the end south drift from west crossent from northwest drift in the Central tunnel is in a quartz formation which assays from $2 to $10 per ton. The north drift from 420 level of Andes is in a quartz and porphyry formation. The workings on the 200 and 800 levels of Best & Belcher are in quartz and porphyry. The face of workings in Gould and Curry on 200 level are in soft porphyry.

In the Savage—On the 1000 level the north lateral drift started from the face of the east drift is advanced 20 feet. They are putting in square sets and stoping ore from the face of this drift. The south lateral drift started from the same point opposite the north drift is advanced 17 feet; face in quartz giving low assays.

On the 1050 level the west crosscut from the sixth floor of the south ore stopes was advanced 9 feet; total length 70 feet; face is in low-grade quartz. On the fourth and tenth floors of these ore stopes they have started east prospecting drifts, which are advanced respectively 6 and 10 feet. These drifts are in porphyry and quartz giviug low-grade assays.

On the 1100 level the north lateral drift for the station was advanced 20 feet; total length 263 feet; face is in quartz and porphyry.

Kennedy District.

New Era: On the Olympia claim, a mile north of town, owned by Riley, Burkim & Davidson, an incline is down 107 feet on ledge matter, assaying from $50 to $100 in gold and silver.

The Imperial mill is fast nearing completion. When the concentrators arrive, the mill will he nearly ready for operations, and capahle of reducing 1200 tons of ore each month.

The *New Era* predicts that iuside of two months 500 men will be working in the mills and mines of Kennedy.

OREGON.

Virtue District.

PUSHING THINGS.—*Democrat:* The Columhia mine is soon to hecome a healthy gold producer. The property has been hought by a Chicago capitalist and Toppy Johnson of California. He is the superintendent and has a force of men employed in the mine and building a boarding house, lodging house, office, etc. A site and building is also being prepared for a ten-ton Crawford mill.

BROUGHT IN $1500.—Baker City *Democrat:* Mr. Bartholomew, who, with Messrs. A. C. McClelland and H. Rust of this city is the owner of placer mines on Clark's creek, arrived in the city yesterday with a cleanup of about $1500. Mr. Bartholomew says the season in that section is about over, the water supply having failed.

THE BONANZA MINE.—The manager of the Bonanza Mining & Milling Company, near Baker City, is in Salt Lake conferring with the local directors of the company. He says they have a fine gold property and already it has produced about $50,000 worth of free-milling ore. They have a big ledge which has been developed by a shaft and drifts, but to operate the mine to advantage and to drain it of water and cut the vein on its dip at greater depth, a 750-foot tunnel is heing driven. Mr. Shelton reports a great deal of quartz and placer mining going on in his region with satisfactory results.

THE SALE OFF.—The Black Butte mine at Fox valley, Grant county, is a property that has come into prominence of late on account of the attention paid to it hy experts sent to examine it at the instance of Messrs. Daly and Haggan, who had a bond for its purchase for a consideration of $100,000. Messrs. Bulow and Allen have been waiting patiently to receive instructions to negotiate the deal, hut the word not coming and the hond having expired, the sale is declared off.

THE GOLD OUTPUT.—*Democrat:* The gold output of Baker county for 1894 promises to reach the figures or exceed that of any former year in the history of mining in this section. As the fall season approaches and the supply of water for placer purposes diminishes, cleanups are heing made and daily there arrives in the city at the hanks quantities of gold, either the result of the old-time rocker process or the modern improved hydraulic giant.

The Nelson mines in Pocahontas district, six miles west of Baker City, sent in an output of 165 ounces, of a fineness of $16 to the ounce—$2640—taken from a side race in the claims. Such an amount was quite a surprise to Mr. Nelson, since he did not expect to get more than $1000, only a small amount of ground in this part of the diggings having heen worked. If this result is any criterion to judge of the richness of the other ground washed this season, then there will he a large clean-up at the close of operations.

The Last Chance mine at Cable Cove, operated hy John C. Young with a three-ton Crawford mill, is in with nearly $200, the result of a three-days' run.

Walter Moore, of Sparta, brought in to the Baker City National Bank between $300 and $400, taken from a claim at Sparta with a rocker.

WASHINGTON.

THE MARCUS FLATS.—COLVILLE: W. B. Aris and C. E. Brooks have claimed a large section of the Marcus flats under the mining laws, and are preparing to put in some very extensive works in that line. The sands that are thrown over the flats hy the recent flood accumulated to the depth of from two to ten feet, and are said to he so rich in dust that gold can he panned out at the rate of from one

to five cents to the pan. A wheel will be placed in the river near the town of Marcus for the purpose of raising the water to a height of twenty feet. It will then be confined in flumes and conveyed over a distance of a mile to the sand bars.

THE OKANOGAN COUNTRY.—At Squaw creek a townsite has been laid out, three arrastras are in operation all crushing rich free-milling rock, and a ten-stamp quartz mill is in course of erection. Crosby Bros. have an order in for a five-stamp mill and Kingham also proposes to erect one a mile north of the townsite.

Three hundred sacks of rich sulphide ore from the Highland Light and Hidden Treasure claims are now on the bank of the Columbia and will go to the Everett smelter for reduction. There are 200 people there, and the mines look well. Work is being pushed on the majority of the claims, and each one seems to improve with development. It is expected that some of the older propositions will be sold before fall to companies able to develop them. The greatest depth yet gained is sixty feet, the longest tunnel 112 feet, the former on the Highland Light, the latter on the Hunter.

A tunnel is being driven on the Ransomet claim. They expect to cut the vein at a depth of seventy feet in less than one week.

The Ben Hur and the Mountain Lily claims are looking well. An average assay of the Ben Hur vein shows $86 gold and nine ounces silver.

Excitement has been caused by the discovery of good placer ground eight miles northwest on Gold creek.

AROUND NELSON. The Silver King on Toad mountain has sixty men working, and has let the contract for the hauling of fifty tons of machinery from Nelson to the mine, a part of which is now on the ground. The consulting engineer is expected out from England in September, to decide upon the nature of additional machinery needed. The mine will soon ship 400 tons of ore to Denver.

The Poorman, near Nelson, is running night and day, both at the mine and the mill.

The Nelson Hydraulic Company will turn water on their placer ground at Fry creek, eight miles from Nelson, this week.

On her trip down the Nelson brought out twenty-six tons of high grade concentrates from the No. 1 at Ainsworth. This shipment runs 350 ounces, and it is intended for the Tacoma smelter.

IDAHO.

PIERCE CITY PLACERS. The Pierce City placer district is reported turning out well. One company controls six miles of ground along French creek, which they are groundsluicing with gratifying results. They intend to put in hydraulic works. The claim adjoining theirs was worked in a primitive way in 1882, and frequently produced $800 to $800 a day. The finding of $8 and $10 nuggets is not an uncommon occurrence now.

MONTANA.

THE SPOTTED HORSE.—*Madisonian:* Lewistown reports say one of the richest strikes ever known in the Judith mountains was made a week ago in the old Spotted Horse mine. A large pocket was found of ore running $10,000 to $13,000 in gold per ton. So far the extent of the body is not known, but during the past week more than $150,000 in ore has been removed. But two men are at work taking out ore, and the average is $15,000 per day to each man. This ore is not worked at the mills, but shipped to the Omaha smelter. This find proves the Spotted Horse to be the richest gold mine ever discovered in this State, leaving the celebrated Cable and old Penobscot far in the background. While a number of rich pockets and "kidneys" have been found in the Spotted Horse, this discovery is the most extensive yet found.

HIDDEN SUNLIGHT.—*Mining Area:* Dr. Head and J. B. Lockwood have bonded the Hidden Sunlight, Charles H. and the Little Bell mines in Lump Gulch to Messrs. McFarlane & Brock for $40,000 two years bond and lease. Parties have commenced work and are fully equipped to develop property. These claims are in the midst of good producing mines in this district.

THE BROADWATER AND BENTON.—*Miner:* The machinery at the Broadwater has been put in place, and the building at tunnel No. 3 erected. The showing at tunnel No. 2 continues good. There is a large body of ore yet intact toward the face of the upper tunnel.

Fine ore is being taken out at the Benton. A small seam is reported to run 27,000 ounces of silver to the ton. Of course the amount of such ore as this is very limited. The second-grade ore now being taken out averages about 400 ounces to the ton, and there is considerable gold in it. It is expected to commence shipments again shortly.

SOUTH DAKOTA.

ON CASTLE CREEK.—Harney Peak *Mining News:* Hannan & Baker have made a discovery near the Lookout mine on Castle creek. The ledge which they have found is 100 feet wide and is traceable for a long distance. The rock is a heavy pyrite ore, of which there are chunks which are nearly solid iron. The surface ore has been pretty thoroughly tested by assays, and ranges between $5 and $10 a ton. That the vein contains an exceptionally rich streak has been proven by one assay, which went $11,000 in gold to the ton of rock. At water level this kind of ore will turn free milling.

UTAH.

AT MERCUR.—*Tribune:* Messrs. Cole and Andrew, who have a bond on the Fairchild group at Mercur, have resumed work on the mine with a double shift.

The Glencoe people have two shifts of miners doing development work on their property and a similar force on the Lion location.

The Red Cloud mine has developed an eight-foot body of gold ore, about 700 feet north of the Sunshine property, which is also showing up a bonanza. The property is being worked by the Red Cloud Mining Company under a bond, and so encouraged are they that negotiations are on for the erection of a mill to convert the output into gold bullion.

The prospects of a mill for the Sunshine group are said to be very favorable. The ore developments are of an assuring character, and the 25-foot ore body is reported to be more than holding its own. Jacobs and Schen of this city have control of this property.

WILL TRY SPRAYING TUBES.—W. A. Graves has gone to Mexico with a consignment of spraying tubes to be used by the Pan-American Mining Company in the treatment of their gold ore by the cyanide process. It is claimed that tests made on a small scale demonstrate that by using the tubes in connection with the cyanide process in the solution tanks, a largely increased percentage of the gold value in the ore is obtained. The company is treating 100 tons daily at present, but with the new idea in full operation it is expected that the capacity, by quickening the precipitation, will increase to 150 tons daily.

MERCUR.—*Mercury:* Parties have been figuring for some time on lensing the Mercur dump and putting it through a cyanide solution a second time. There is a certain amount of gold in the ore which the cyanide will not touch on the first treatment, but which can be extracted after the tailings have lain for a while, and it is estimated that the whole dump can be treated at a saving of a dollar or more a ton, out of which, if the tailings are handled automatically, a fair profit could probably be realized.

NEW MEXICO.

THE MOGOLLONS.—*Enterprise:* A carload of new machinery for the Confidence Company's new mill has been shipped to Whitewater.

A large body of Peacock ore has been struck in the lower workings of the Maud S. which is very rich, running $60 to $70 per ton in gold, besides giving high assays in silver.

A blast furnace is building to smelt the rich silver ores of the Silver Cell and Climax mines. There is on hand about a ton of wire silver which is fully 60 per cent pure silver, and about 40 tons of second-class ore that will run 200 ounces in silver per ton. The Silver Cell mine, which produces this rich ore, has had comparatively little development done upon it. A shaft 135 feet in depth has been sunk upon the vein, and, at a depth of 50 feet, 75 feet of drifts have been run. In addition to this an adit level has been started to tap the bottom of the 135-foot shaft. At 100 feet from the month of the level a shaft has been sunk 55 feet in depth. The level, when extended to tap the deep shaft, will be 200 feet in length. Through all the workings of the mine very rich native silver ores are found running from 5,000 to 20,000 ounces per ton. The Climax mine, which is an extension of the Silver Cell, and upon the same vein, produces the same character of high-grade ore. The Climax has a 75-foot shaft upon it, little other development having been done. With the small amount of development as described above, these mines have produced about $30,000 worth of silver, even at present low prices of the metal. The mines are situated about seven miles north of Silver City, and about two miles south of Pinos Altos. The new smelter is being erected close to the mine.

COLORADO.

Gilpin County.

NEW STYLE OF STAMP MILL.—Central City *Register-Call:* A new style of stamp mill is in course of erection at the Empire mill in Black Hawk. It differs from the modern Gilpin county mill in several respects in that the batteries and housings are to form one solid casting which will weigh 4100 pounds, and the speed when running will be 65 drops per minute, the batteries having single issue. The stamps will have a weight of 650 pounds each, and the stamps ten-inch drop. The plates on the inside for amalgamating purposes are so arranged as to be taken out and replaced without raising the stamps. The mill will also be arranged for automatic feeding, thereby lessening the expense of a feeder. Tables below each stamp battery for amalgamating use will be the same as have been in general use here for several years. One of the advantages of the mill is that it will crush double the amount of ore now crushed in the present mills, and at the same time will amalgamate the gold to a higher percentage. One of these mills of twenty-stamp capacity is now in successful operation at Cripple Creek by the Summit Gold Mining and Milling Company.

A great deal of placer mining is being carried on this summer in the gulches of the county, both by Chinamen and white men, and the miners all appear to be making money. At several points in the main gulch running through Central City pay gravel is being washed, and between Central and Nevadaville several men have laid a long striug of boxes and are saving the gold.

In Nevadaville the ground where mills have stood is being washed for the tailings it contains, and valuable shipments have been made by the miners at different times this summer. The placer miners who are following the rich streak of pay gravel discovered by A. Ragor, near the head of Nevada gulch, are washing out a gulch 20 feet wide and from 14 to 16 feet deep, and are being amply repaid for their labor in moving this large amount of ground. The placer mines of this county have been big producers, and though they have already yielded thousands of dollars in gold their supply is not nearly exhausted, and they will probably continue to pay for years to come.

ARIZONA.

A FORTY-STAMP MILL STARTING UP.—Tombstone *Epitaph:* The old Miuas Prietas mill, in Sonora, northeast of Torres station, of forty stamps, on which dust and rust has laid heavily for years, is being overhauled and put in order for running again. The mill ran for sixteen years on ore from the Miuas Prietas mine, till a fire gutted the timbering of the mine. It seems that a mining location in Mexico does not follow the "lead or lode or vein," but makes a bee-line for the center of the earth, outside of which they dare not go. The Prietas mine at the time of the fire had encroached in many places on its neighbor, the Creston, owned by another company. It had not been completely worked out, but when the expense of puttiug in new timbering for what was left of it was considered, it was deemed best to abandon the mine.

The development of the Creston meanwhile has gone on well and has given forth some rich rock, all averaging so well that the company owning the same have leased the old Prietas mill and will soon have it in running order.

THE BULLARD MINE.—*Courier:* J. H. White and W. C. Parsons, former owners of the Contention mine at Tombstone, have returned from a trip to the Harcuvar mountains, where they inspected the famous Bullard mine for which the owners recently refused an offer of $250,000 cash. The Bullard mine is an immense deposit of gold ore of apparent volcanic origin. Three arrastras are steadily running on the mine, the average yield of the ore being $10 per ton. The ore assays all the way from $8 to $60 per ton.

Coast Industrial Notes.

—The China-Japan war has stimulated San Francisco flour exports.

—A monster log raft, which will be shipped to San Francisco, is being constructed at Astoria, Or.

—The Northern Pacific coal mines at Roslyn, Wash., reopened yesterday, the strike being off.

—There is a revival of the flax industry in Oregon. Around Scio some 600 acres is in flax this year.

—Specifications and plans have been made for the electric light plant at Anaheim. The cost is estimated at $7000.

—The Viticultural Commission says 6,713,240 gallons of wine were exported from this State during the first six months of the current year.

—On the Pacific coast there are 132 salmon canneries, 38 of which are located in Alaska, 39 in British Columbia, 23 in Washington, 24 in Oregon and 8 in California.

—It is figured that the Columbia river salmon pack for the season that closes to-day will be 421,000 cases, of four dozen one-pound cans each, as against 385,500 for last year.

—The Oregon Sugar Company has incorporated to cultivate the sugar beet and to build and operate machinery for refiuing sugar. Capital stock $50,000. Principal place of business Portland, Or.

—The Reno Water, Land and Light Co. has bought 155,000 feet of lumber, to be used in the construction of new flumes on their Highland ditch, in pursnance of their policy of continuing the ditch into Prosser valley.

—The Chino sugar factory and refinery, the largest and most complete in the United States has started up. With this season's additions to the plant, made at a cost of $200,000, the factory will use 1000 tons of beets per day, and the daily output of refined sugar will be 140 tons.

—The United States battleship Oregon is expected to have her preliminary trial trip next week. She must develop at least fifteen knots an hour, but at the Union Iron Works it is thought her speed will be nearer seventeen, which would mean a handsome bonus to her enterprising builders.

—It is proposed to build an electric road from Merced to the Yosemite. The length as surveyed will be sixty-two miles, following the course of the Merced river. The power will be secured from a dam already built at Merced falls, and Merced will be furnished power for light and manufacturing.

—When the five new engines now being placed at stations B and C in this city to supply the recently laid underground electric wires are in operation, it is believed they will constitute as large and well equipped electric light stations as any in the United States. The capacity will be 72,000 incandescent lights of 16-candle power.

—Francis Smith & Co. of this city are making and placing twenty-two miles of pipe line for the Oakland Water Company, from Alvarado to Oakland. From the wells to Twenty-third avenue the pipe is thirty-inch; thence to Oak street the pipe is twenty-inch. It is expected to have the entire work finished by November 15th. To manufacture and successfully put in place twenty-two miles of such large iron pipe is a work of no ordinary magnitude, and is well done throughout, Messrs. Smith & Co. going ahead at the rate of 800 feet a day.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Philip Hayes in the Hayes & Stedman Mine near Gold Lake, Sierra Co., to deposit tailings on a flat in Mohawk Valley; from Stephen Soriceo in the Mohawk Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in a ravine; from Frank F. Vanzhl in the William Tell Mine near Johnsville, Plumas Co., to deposit tailings behind log and brush dam in Yankee Ravine; from Nicola Rossi and Peter Lorenzo in the Grizzly Bear and Garfield Flat Mines near Johnsville, Plumas Co., to deposit tailings behind dams in Squirrel Creek; from Keegan and Lowe in the Howard Mine near Onc, Shasta Co., to deposit tailings behind brush dams in a ravine; from C. H. Steel in the Steel & Co's Mine near Brownsville, Yuba Co., to deposit tailings behind stone dam on New York Flat; and from the Consolidated Amador Volcano Hydraulic Gold Mining and Land Co. of California in the Cliff Hill and Elephant claims, to deposit tailings in Sutter Creek; gives notice that a meeting will be held at Room 12, Flood building, San Francisco, Cal., on Monday, August 13th, 1894, at 1:30 P. M.

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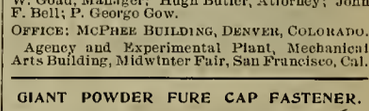

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Gold Quartz Mine For Sale.

A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which ten-dollar rock is now being crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

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Electrical Progress.

Electric Motors.

The electric motor was invented eight years before the dynamo, and for several decades was considered of more importance, both scientifically and practically; the motors for Jacobi and Page, for example, being far more powerful than any contemporaneous dynamo. A search through the patent records of the United States and England would show also that more attention and greater expectations were then based upon the motor. This was undoubtedly due to the fact that inventors hoped to obtain a source of power which would rival or surpass the steam engine. It was gradually realized, however, that the cost of electrical energy obtained from a primary battery is so high that it cannot compete with a steam engine. The number of pounds of zinc consumed in the best battery, per horse-power hour, is about equal to the weight of coal required to give the same amount of energy in a steam engine, and since zinc costs about 50 times as much per pound as coal (in fact, it actually requires several pounds of coal to produce one pound of zinc), it is obvious that the primary battery is far more costly than steam in the generation of power. As a matter of fact, electrical energy from a primary battery at the present time costs at least 10 times and probably 20 times as much as that obtained by the use of a steam engine and dynamo.

The realization of this serious difficulty greatly discouraged scientific men and inventors in regard to the electric motor. A reaction set in against it, and for many years it was comparatively neglected by the best workers. The dynamo was taken up in its stead and developed in the remarkably rapid and successful manner which is the greatest practical achievement of recent times. The neglect of the electric motor continued until about 1887, the dynamo having by that time reached a state of great perfection and being in extensive use for electric lighting. The development of the dynamo, and the laying of electric light circuits through the streets of many cities and towns, provided the very supply of reasonably cheap current which was needed for the motor, and which the primary battery had failed to give.

This fact encouraged inventors and manufacturers to again take up the motor, and since that time its progress in this country has been very rapid; but even now the motor is somewhat overshadowed by the dynamo. The number of electric motors in use in foreign countries is not very considerable, but in the United States there are probably about 50,000 stationary motors and several thousand railway motors. The last fact probably explains why the literature of the dynamo is much more complete than that of the motor, since most of the books are written by Europeans—the time of Americans being occupied rather with making and *using* dynamos and motors than with telling others how to do these things. The most recent history of the motor includes the invention, by Tesla, in 1888, of the two-phase alternating-current motor and the development of the two and three-phase systems. These important systems are now being practically used, and an enormous electric power transmission plant is being installed at Niagara Falls, which is to be operated by the two-phase system. Indeed, it may be said that the progress of the electric motor at the present time is equally as rapid as, and more interesting than, that of the dynamo.

In considering the construction and action of the electric motor, the first and most important fact is its great similarity to the dynamo, or, more strictly speaking, it is practically the same machine used in exactly the opposite manner. The dynamo is a machine which generates electric current when driven by mechanical power. A motor is a machine that develops mechanical power when supplied with electric current; thus the functions of the two machines are exactly the converse of each other; nevertheless, identically the same machine can be used for either purpose, that is to say, the machine is perfectly reversible. It is also a fact that a machine that is good for one purpose is good for the other. The tendency now is for manufacturers to make exactly the same machine, and use it for either purpose indiscriminately, with only very slight differences in the details of winding connections, etc.

Non-magnetic Watches.

Within the last ten years a new class of troubles with pocket timepieces has been developed. Not only inferior watches, but also fine chronometers, have a way, often rather abruptly, of becoming quite irregular in their conduct. It is not simply that they begin to lose time in a remarkable manner, after running very correctly for months, or even years, but there are such variations in the losses that it is impossible to regulate them. One day the watch is only a minute behind, and maybe it is fifteen the next. When the owner takes such a timepiece to a watchmaker, the latter, on learning the symptoms, will probably open the case and set a tiny compass down over the hairspring. If the magnetic needle then becomes suddenly convulsed, twitching first in one direction and then in the other, the expert smiles and says: "Yes, I thought so. Well, sir, your watch is magnetized. Been riding on the trolley cars, I s'pose, or standing near a dynamo." The usual cure for such a disorder is to draw the watch through a coil of wire carrying an alternating current of electricity. Such treatment, however, does not preclude the possibility of another attack, although it may be a long time before the difficulty recurs.

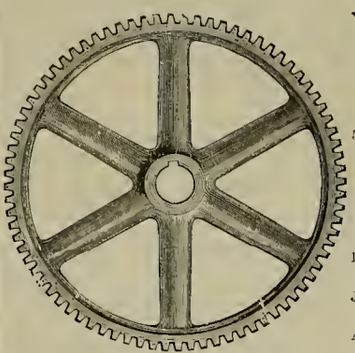
What is still better than this is to make those parts of a watch liable to be affected by trolley currents, dynamos or motors out of non-magnetic material, instead of steel. Two or three foreign firms and at least one well-known American manufacturer now pursue that plan. For the hairspring palladium is employed, and for the escapement a composition known as "Paillard's metal." This is a foreign invention, and the exact nature of it is kept a secret. Of course, there are other methods of carrying out the general idea, and perhaps there is a hint of one it this solemn remark of the London *Watchmaker*, made after discussing the non-magnetic watches of America: "We are possessed of facts which we think it is as well in the interest of the English trade not to publish, but we are willing to supply them to our own manufacturers.

An apparatus for discovering internal flaws in iron and steel has, it is reported, been invented by Captain de Place, consisting of a small pneumatic tapper worked by the hand, with which the sample of steel or iron is tapped all over. With the tapper is connected a telephone with a microphone interposed in the circuit. One operator is required to apply the tapper, and the other to listen through the telephone to the sounds produced. Both are in electrical communication, and in separate apartments, so that the direct sounds of the taps may not interrupt the listener, whose duty it is to detect flaws. In applying the system, one operator places the telephone to his ear; and while the sounds produced by the taps are normal, he does nothing. As soon as a false sound, which is distinguishable from the normal sound, is heard, he signals for the spot to be marked, and by this means is able not only to detect a flaw, but to fix its locality.

GEO. E. BELMOR,
OF THE BELMOR BOILER WORKS,
Has Removed from 210 Mission St. to 52, 54 and 56 Bluxome St., bet. 4th and 5th Sts.
(To the old H. W. Rice Machine Works.)
FOR BOILERS, DREDGING BUCKETS AND SHEET IRON WORK, CORRESPOND.

CLEAR CREEK, OREGON.

The First CRAWFORD Mill in Oregon has been erected at the Red Boy mine. Trial run of 22 days showed 220 tons treated, yielding over $2000, bullion, a saving of 85 per cent. Wear and tear, 20 cents per ton. No plates or screens. Simplest, cheapest and most economical mill on the market. *Special terms offered the first mill introduced in any mining district.*
Oregon Agent, E. J. GODFREY, Baker City. Full particulars from
Mechanical Gold Extractor Company,
W. O. ROSS, Secretary and Treasurer. 47 Broadway, New York.



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MACHINISTS
—AND—
MECHANICAL ENGINEERS,
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SPUR AND BEVEL GEARS cut to order.
PATENT MODELS and Experimental Machinery of all kinds.
SHAFTING, PULLEYS and BOXES.
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DRAWINGS, PLANS and SPECIFICATIONS made for new machinery.
JOBBING of every description promptly attended to. FINE WORKMANSHIP GUARANTEED.
Also Pacific Coast Agents for the SHARPLES CREAM SEPARATORS.

PLACER AMALGAMATORS
Combined with Steam Shovel or Dredge.
BUCYRUS SYSTEM.
NEW METHOD OF PLACER MINING.
Saves all the Gold. Uses very little Water. Treats large quantities at Low Cost.
Built solely by the
BUCYRUS STEAM SHOVEL AND DREDGE COMPANY,
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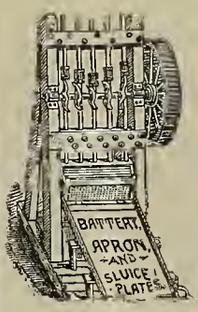


To Gold Miners!
Silver Plated Copper Amalgam Plates
For Saving Gold.
GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled.
Twenty-five Medals Awarded.
SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
653 and 655 Mission Street, San Francisco, Cal.
E. G. DENNISTON, - - - - - - - - - - - Proprietor
Every description of work plated. Send for Circular.

Thomas Price & Son,
Assay Office, Sampling Works
And Chemical Laboratory.
524 Sacramento Street, San Francisco, Cal.

Practical Information.

Ruins of Cochiti.

A mile from Allerton, N. M., are the ruins of an ancient pueblo, more than a thousand feet above the canyon, and accessible at only one place. Once on this summit, a wilderness of magnificence lies at one's feet. Twenty miles to the southeast can be traced the winding Rio Grande past the Indian pueblos of Cochiti, San Domingo, San Felipe and Santa Ana, where it is lost to view. East are the Santa Fe mountains, where, snugly ensconced, lies that ancient of all American cities, Santa Fe. Mountains and canyons greet the view in all other directions. From any data that can be gained in conversation with Indians or native people, this pueblo was in ruins in 1728. The pueblo is about 400 feet square, with a row of dwellings in the center, making two rectangular spaces entirely surrounded by the outer dwellings. Investigation shows that the outer dwellings contained at least three rooms of two stories.

In each rectangle is a large cistern lined with stones firmly mortared. The bottom of these, which is at least ten feet below the surface, is a sort of cement and very hard. This was demonstrated by digging. The tier of buildings forming the line through the center excited our curiosity, says a writer, and amply were we paid for our labor. In one room we dug at least four feet to what we reasonably supposed was the floor, on account of its hard, smooth bottom. In this we found tons of slag thoroughly impregnated with copper. Our conjectural theory was that this room was the smelter, if one can use the term. Charred wood, corn, corn cobs, seed, copper ore, and peculiar wheels, similar to emery, were carried away by us. These ruins deserve the attention of scientists and antiquarians. The houses are built of pomice stone laid in mortar and plastered on the inside. Five hundred feet above the town of Allerton, and overlooking the town, are the ruins of the ancient cliff dwellers. In fact, every summit in the immediate neighborhood shows these rooms; some are almost gone, having been washed away; others are of perfect preservation. The peculiar sign writings are everywhere visible. When were they occupied? Research may tell.

Return of the Wanderer.

Halley's comet is coming back—the comet which in the year 1066 shed a celestial splendor over the Norman conquest, and whose terror-inspiring visit was commemorated by the hand of Queen Matilda in the Bayeux tapestry; the comet that in 1456, the year of the battle of Belgrade, scared the Turk and Christian alike and was anathematized by a bull from the Pope; the comet whose strange scimitar form chilled the marrow of the ignorant and superstitious at its latest return in 1835. It is yet far away, says the Providence *Journal*, but the eye of science sees it, already within the orbit Neptune, rushing sunward and earthward with constantly increasing veloeity as it falls along the steep curve of its orbit. And a call to arms, a call for preparatiou, has just been issued from one of the chief watch towers of astrouomy. Professor Glasenapp announces that the computing bureau established by the Russian Astronomical Soeiety has undertaken the caleulatiou of the true path of Halley's comet, with a view to predicting the exaet date of the next return. He hopes that astronomers acquainted with unpublished observations of the comet will communieate the information to the society. After its perihelion the comet was watched retreating out into space until May, 1836, wheu it was finally swallowed from sight. It will be in perihelion again about 1911, but with the greatest telescopes now in existence and the greater ones that may then have beeu construeted, it is probable that the eomet will be deteeted eoming suuward a year or more earlier than that. The fact that the labor of computing the precise time of its returu is already about to begin gives assurance that the next time it will not be a question of how many days, but rather of how many hours or even minutes, the caleulations will be in error.

PETROLEUM SPIRIT, or benzine, is largely used in the silk and wool industries and in "chemieal cleaning" works as a solvent for greasy impurities. It is extremely volatile and inflammable, and has often been suspeeted of being the eause of those mysterious fires which occasionally break out in works and factories where it is much used. The ignition of this spirit has now been shown to be "spontaneous," and to be caused by electrical excitation. In eertain states of the atmosphere, especially wheu it is eold and dry, the spirit beeomes excited and exhibits sparks and flashes of light, to the aecompaniment of crackling sounds, and the ignition of the spirit may take place at auy moment. Kissling, in Germany, recommends that a small quantity of some kind of soap, soluble in petroleum, shall be dissolved in it, and maintaius that this will prevent the electrieal excitation, even when so little as 0.2 to 0.3 is added. The use of soap in spirit that is in a state of exeitatiou always averts the danger of ignition. This form of activity in petroleum spirit is never observed in moist or warm weather, the eonditions of whieh teud to carry off or prevent the manifestation of electrieity, and the soap probably provides the necessary moisture, water being otherwise non-miseible with petroleum spirit.

MAIWATCHIN, in Mongolia, close to the borders of Russian Siberia, is the one city iu the world peopled by meu only. The Chinese women are not ouly forbiddeu to leave their territory, but even to pass the great wall of Kalkan and enter into Mougolia. All the Chinese of this border city are exclusively traders, and they accumulate money till their trading with Europe through Siberia has ereated a suffieient fortnue to return to their uative eities and live in ease with their families.

No. 6.

FRASER & CHALMERS, CHICAGO, ILL., U. S. A.

Also 43 Threadneedle St., E. C., London, England.

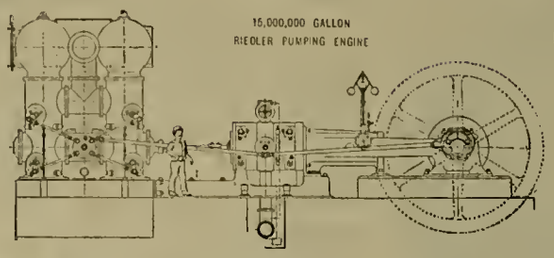
BRANCH OFFICES:
2 Wall St., New York; City of Mexico, Mexico; Salt Lake City, Utah; Helena, Montana; 527 17th St., opposite Denver Club, Denver, Colo.

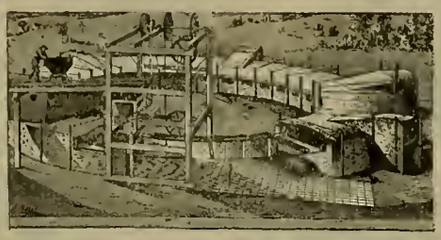
We have in preparation an interesting pamphlet giving numerous cuts and descriptions of RIEDLER Pumping Engines and Air Compressors in America and Europe.

Let us book your address to receive this on publication.

Metallurgists are invited to send for our pamphlet explaining the great merits and economy in use of the

Horace F. Brown Horseshoe Roasting Furnace.





Crushers, Hoists,
Pumping Engines, Corliss Engines,
Boilers, Mechanical Stokers,
Lead Smelters, Pyritic Smelters,
Gold Mills, Silver Mills,
Mill and Mine Supplies.

WATCH FOR NEXT WEEK'S AD.

CASCADE WATER WHEEL

EMBODYING IN PRINCIPLE, THE
HURDY-GURDY or IMPULSE WHEEL.
ADAPTED TO ALL HEADS.

FROM 30 FEET TO 2000 FEET.

Our experience of **33 YEARS** in the water wheel business enables us to suit every requirement of Water Power Plants. Send for Illustrated Pamphlet.

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Absolutely Acid and Alkali Proof.

For CHLORINATION WORKS and Preserving Wood and Iron from Acid Attack, Rust or Decay.

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PARAFFINE PAINT CO., 116 Battery Street, S. F

THE

Bailey Fountain Marking Brush.

NEW.
SUCCESSFUL
Everybody Wants It!

Will pay for itself several times a year, saving

Turpentine,
Time,
Trouble.

PRICE, $1.50.

Sent by Mail.
THE TRADE SUPPLIED.
AGENTS WANTED.
Correspond with—

BAILEY & CO., MANUFACTURERS, 12 FRONT ST., SAN FRANCISCO.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 9, 1894.

Silver remains stationary, the expectation that the China-Japan war would advance the quotations being, so far, unrealized. The Ecuador Congress now gives notice that that country will demonetize silver and adopt a paper currency based on gold. The only noticeable new domestic feature is the increased coinage. The United States mints are all busy turning out standard silver dollars. There is 121,000,000 ounces of silver on hand, which cost about $125,000,000. This is covered by "Treasury or coin" notes, redeemable in gold, so long as the bullion exists as bullion. When coined and silver certificates issued these notes are no longer gold obligations, but silver ones. Thus, the present silver standard dollar coinage reduces the gold obligation and relieves the gold reserve, about which so much has recently been said and sung. Should $2,000,000 in silver he coined, it would still leave each gold dollar supporting about $7.75 in gold-hearing obligations. It will thus be seen that the day is still very far off when the Government can sell gold. During the nine years from June 30, 1867, to June 30, 1876, the Government sold $517,000,000 in gold.

During the first seven months of the year the San Francisco mint coined $13,219,156. Of this, $11,125,000 was in gold; the remainder in silver.

The Philadelphia mint, in '93, worked 320 tons of gold. At the same time there was melted and coined 3,050,000 ounces of silver. The working over of the gold is a remarkable record, and in no previous year have all the mints and assay offices in the country combined done so much work. The great amount of 9,310,254 ounces of gold handled during the past year in the Philadelphia mint is phenomenal.

The average for the last eight years is 957,371 ouuces. The entire amount of gold worked up hy the melters' and refiners' department of the Philadelphia mint would make a pile of 592¼ cuhic feet, with each cuhic foot weighing ahout 1070 pounds. This would make a mass ten feet square and five feet eleven inches high. In the handling of this immense amcunt of precious metal the chief of the melters' and refiners' department is allowed a legal wastage of one ounce to every 1000 ounces handled, hut nothing like the legal allowance is wasted. During the past year it was about ten per cent of that amount.

The Director of the Mint, under the law of 1890, has fixed the value in United States money of foreign silver coins as follows for the next ninety days: Mexican dollar, 49.7 cents; Peruvian sol, 45.7; Ecuadorian sucre, 45.7; Colombian peso, 45.7; Bolivian Boliviano, 45.7; Central American peso, 45.7; Japanese yen, 49.3; Chinese tael of Shanghai, 67.6; Chinese tael of Haikwan, 75.3; Russian ruhle, 36.6.

Copper continues quoted at former figures; about 15,000 tons are monthly produced, one-half of which is exported. Foreign copper mines are turning out about 6500 tons per month.

From Almaden, Spain, comes the statement that the farther the distance traversed in the mine the hetter the quality and the greater the quantity, which is not wholly satisfactory from a local point of view. The New Almaden mine produced 6614 flasks in '93, the Napa Con. 6120, and the New Mirahel 5211. The California product in '93 was 30,164 flasks of 76½ pounds each.

Free or "protected" coal is still a dehatable question. Canada imposes a tariff of 67 cents a ton on United States coal, hut would not object to have dominion coal admitted here free.

During last week 9124 tons coal arrived from coast mines; 18,375 foreign. The yards are full and demand is very light.

New York Prices.

NEW YORK, Aug. 9.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	28¾	62½	....	....	....
Friday	28¾	62⅝	9 00	3 10	19 00
Saturday	28¾	62⅝	9 20	3 10	....
Monday	28⅞	62⅝	....	....	....
Tuesday	28⅝	62¾	9 20	3 10	19 25
Wednesday	28¾	62¾	....	....	....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers', 60 days	$4.88¾
London Merchants	$4.86¾
London Sight Bankers'	$4.89½
Refined Silver, per ounce	.62¾
Mexican Dollars, nominal	51½@51¾

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	12
BORAX.			
Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¾
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Bar, base	—	@	2½
Norway, base	—	@	4½
PIG IRON. Spot.			
Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	—	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	—	@	— —
Clay Lane White	22 50	@	— —
Langloan	23 50	@	— —
Gartsherrie	23 50	@	— —
Barrow	22 50	@	— —
Cargofleet	—	@	— —
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5¼
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10
QUICKSILVER.			
Home trade, per flask	35 75	@	36 00
STEEL.			
English, lh	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼
PIG TIN.			
Spot, per lb	22	@	22½
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 75
Coos Bay			5 50
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 25
West Hartley			8 25
TO LOAD—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	15 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	8 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, August 9, 1894.

Ever since the Rule regime there is a quietude unsatisfactory to those who helieve in hrisk sales and quick returns. Demand is dull and plungers are not visihle. The rumors that Milt Ballard was going to open up a body of ore he knew of in Con. Va., that Superintendent Lyman had tendered his resignation, etc., have been turned under. The quotations of stock keep up, but the volume of business is light.

The test of Crown Point ore at the Mexican gave an average gold yield of $8.23 per ton. Figuring on a total cost of $5.25 for mining and milling, this is very satisfactory. It is thought that the test of Savage will show as well.

Following is the cash halance reported hy the several mining companies on hand on the 6th inst.:

Alpha	$6,700	Julia	$1,084
Alta	4,304	Justice	129
Andes	16,889	Kentuck	1,804
Belcher	12,023	Lady Washington	23
Best & Belcher	17,084	Mono	2,084
Bullion	3,699	Mexican	18,568
Bulwer	4,647	Nevada Queen	945
Bodie	31,961	Occidental	1,155
Caledonia	5,605	Ophir	10,955
Challenge	1,598	Overman	351
Chollar	5,411	Potosi	3,300
Church	22,256	Savage	51
Con. Imperial	2,170	Scorpion	455
Confidence	4,288	Seg. Belcher	5,083
Con. New York	3,293	Silver Hill	248
Con. Cal	97,098	Sierra Nevada	4,411
Crown Point	12,396	Standard Con	33,316
E. Sierra Nevada	573	Syndicate	914
Exchequer	3,982	Union Con	12,722
Gould & Curry	2,186	Utah	1,088
Hale & Norcross	22,498		

The Belle Isle reported an indehtedness of $2800; North Belle Isle, $2.24; Commonwealth, $21,448; Grand Prize, $532; Navajo, $671; North Commonwealth, $2,149.

During the month $104,370 is asked for in assessments. Of this the Comstock calls for $75,120: Nevada county, $15,000; Placer, $5000; Calaveras, $2000; Mexico, $7250.

The following illustrates the changes of the week:

MINES.	2	9
Utah	....	....
Sierra Nevada	$ 82	68
Union	70	64
Mexican	1 20	1 15
Ophir	2 25	2 20
Consolidated California and Virginia	4 00	4 00
Best & Belcher	1 30	1 20
Gould & Curry	60	54
Savage	36	43
Hale & Norcross	73	74
Chollar	37	35
Potosi	50	48
Bullion	21	17
Exchequer	....	....
Alpha	12	11
Confidence	1 10	1 05
Yellow Jacket	48	45
Crown Point	80	80
Belcher	92	....
Overman	15	14
Justice	....	....
Alta Consolidated	....	23
Consolidated New York	....	....
Challenge	45	40
Bodie	1 15	1 10
Andes	48	....

San Francisco Stock Board Sales.

SAN FRANCISCO, Aug. 9, 1894.

FIRST SESSION—9:30 A. M.

300 Alpha	11	250 Hale & Norcross	74
100 Alta	23	50 Mexican	1 15
300 Best & Belcher	1 20	500 Occidental	10
200 Chollar	35	300 Overman	14
310 C. C. & Va	4 00	150 Savage	43
200	3 95	600 Seg Belcher	14
100 Confidence	1 05	50	15
150 Crown Point	80	200 Sierra Nevada	68
100 Gould & Curry	54	200 Union	64

SECOND SESSION—2:30 P. M.

100 Bodie	1 10	200	77
50 Bulwer	15	100 G & C	54
100 Bullion	17	50	53
100 Challenge	40	150 Hale & Norcross	72
400 Chollar	28	100 Mexican	1 15
1000	30	300 Ophir	2 20
300 Con Cal & Va	3 90	100 Potosi	48
300	3 95	800 Savage	40
200 Crown Point	78	100 Yellow Jacket	45

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Bullion M Co, Nevada	43	15c	Aug 7,	Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	30c	Aug 9,	Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27,	Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17,	Aug 24, Sept 21	C C Harvey, 309 Montgomery
Mexican G & S M Co, Nev	50	25c	June 12,	July 26, Aug 15	C E Elliott, 79 Nevada Block
Occidental Con M Co, Nev	16	10c	May 31,	July 23, Aug 14	A K Durbrow, 69 Nevada Block
Osborn Hill G M Co, Cal	3	15c	July 7,	Aug 7, Aug 28	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17,	Aug 21, Sept 11	G D Edwards, 414 California
Potosi M Co, Nev	42	25c	Aug 2,	Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24,	Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	20c	July 27,	Aug 30, Sept 19	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18,	Aug 22, Sept 11	E L Parker, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31,	Sept 11, Oct 2	J W Pew, 310 Pine
Union Cons M Co, Nev	49	15c	June 20,	July 25, Aug 15	C C Harvey, 309 Montgomery
Yellow Jacket S M Co, Nev	57	25c	Aug 2,	Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Altoona Q S M Co, Cal	Special	C Allenherg, 630 Brannan	Aug 16
Alta S M Co, Nev	Annual	J E Jacobus, 309 Montgomery	Aug 16
Independence M Co, Nev	Annual	J W Pew, 310 Pine	Aug 20
Jack Rahhitt M Co, Nev	Annual	J F Holling, 30 Post	Aug 13
Navajo S M Co, Nev	Annual	J W Pew, 310 Pine	Aug 14
N W C M Co, Cal	Special	F A Hussey, 314 Montgomery	Aug 16

Dividends for July.

MINING COMPANIES' JULY, '94, DIVIDENDS.

	July.	Total for year '94.
Alaska-Treadwell, Alaska	$75,000	$375,000
American, Montana	....	21,658
Aspen M. & S. Co., Colorado	20,000	40,000
Bald Butte, Montana	25,000	125,000
Belden Mica, N. H	5,000	35,000
Borecl, Colorado	....	500,000
Boston & Montana, Montana	50,000	50,000
Bullion B. & C., Utah	50,000	125,000
Central Eureka, Utah	15,000	30,000
Calumet & Hecla, Michigan	....	500,000
Champion, California	3,400	23,800
Copper Queen Con., Arizona	....	150,000
De Lamar, Idaho	100,000	300,000
Elkhorn, Montana	....	65,626
Elkton, Colorado	6,000	42,000
Franklin, Michigan	....	80,000
Golden Fleece, Colorado	12,000	84,000
Golden Reward, South Dakota	5,000	35,000
Golden Rule, California	5,000	10,000
Harqua Hala, Arizona	....	36,000
Heckla Con., Montana	15,000	15,000
Helena & Frisco, Montana	....	15,000
Highland, California	10,000	25,000
Homestake, South Dakota	18,750	131,250
Hope, Montana	25,000	50,000
Horn Silver, Utah	50,000	150,000
Iron Mountain, Montana	....	20,000
Kennedy, California	48,000	336,000
Mayflower Gravel, California	10,000	70,000
Mercur, Utah	25,000	175,000
Morning Star Drift, California	9,600	55,200
Moulton, Montana	....	20,000
Moose, Colorado	12,000	57,200
Napa Con., California	....	20,000
Omaha, California	3,600	28,800
Provo Con., Utah	10,000	40,000
Quincy, Michigan	200,000	400,000
Rico-Aspen, California	25,000	175,000
Smuggler, Colorado	50,000	400,000
Standard Con., California	10,000	30,000
Tamarack, Michigan	50,000	250,000
Trinity River Hydraulic, Cal	....	12,500
Union, Colorado	6,000	18,250
Union M. Co., California	2,500	5,000
Victor, Colorado	15,000	60,000
W. Y. O. D., California	3,000	21,000
Zion M. Co., Nevada	10,000	20,000
Totals	$ 979,850	$5,228,284

Twenty-eight mines paid dividends in June, amounting to $879,063.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 31, 1894.

523,954.—POTATO PLANTER—D. M. Baldwin, Los Angeles, Cal.

523,886.—CARTRIDGE HOLDER—M. H. Durst, Wheatland, Cal.

523,963.—WAVE MOTOR—E. Gerlach, Santa Monica, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished hy Dewey & Co. in the shortest time possible (hy mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possihle time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TRUSS.—No. 522,764. July 10, 1894. Robert Magler, San Francisco. This invention relates to an adjustable, automatically acting pressure plate and pad for the support of abdominal hernia. It consists of an elastic plate having an arched concave opening at the lower edge whereby it is adapted to fit the parts to he treated, and in conjunction with this, of an elastic ring having one side fixed at the crown of the arch and the other crossing the lower part, together with a pad of soft material fitting the pressure plate, and adapted to press against the part to be treated. This device is provided with suitable pad and thigh straps by which it is secured in place and the pressure varied and regulated as may be desired. The straps are provided with loose tubular sheathing which allows them any desired movement without chafing the body. This truss can be worn as a protector against rupture and will recommend itself to the public on account of the virtues above enumerated.

Every Inventor Wants a Good Patent

Or none at all. To secure the best patents Inventors have only to address DEWEY & Co., Pioneer Patent Agents, No. 220 Market St., San Francisco.

There are many good reasons why Pacific Coast Inventors should patronize this Home Agency.

It is the ablest, largest, best, most convenient, economical and speedy for all Pacific Coast patrons.

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Conducted from 1863 hy its present owners (A. T. Dewey, W. B. Ewer and Geo. H. Strong), this agency has the best knowledge of patents already issued and of the state of the arts in all lines of inventions most common on this coast.

Patents secured in the United States, Canada, Mexico, all British colonies and provinces, England and other civilized countries throughout the globe.

Caveats filed, assignments duly prepared, examinations made, and a general Patent Agency business conducted.

Established and successfully and popularly conducted for nearly thirty years, our patrons number many thousands, to whom we refer with confidence, as men of influence and reliability. Old and new inventors are cordially offered the complimentary use of our library and free advice, etc. No other agency can afford Pacific States inventors half the advantages possessed by this old, well-tried and experienced firm.

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— MANUFACTURERS OF —

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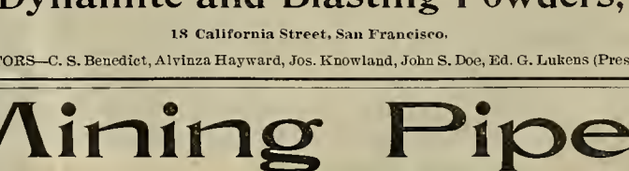
Mining Pipe!



STEEL OR IRON.—We make pipe of either, hut recommend STEEL, it heing superior to iron in many particulars and inferior in none.

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COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

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In Southern California.

Not since the days of '49, says a San Bernardino dispatch, has there been such activity in mining circles as there is now in southern California, and the movement of wagon trains from here and other points nearer the gold fields revives the old days vividly in the minds of the old-timers.

Out upon the desert, a few miles north from Golf's, where but a few months ago was nothing but barren uninviting desert, is now the thriving camp of Vanderbilt, with its newspaper and railroad connection with the outer world by means of the Nevada Southern and Southern California railroads. Except the laying off of a few of the men because of the recent strike upon the railways having cut off the supplies necessary for continuing operations, every miner of ability who came to this district was afforded employment. A new voting precinct and school district were formed here and a special tax voted by the progressive miners to keep school going.

A big force of men is at work in the Bronze mine, and the mill was running night and day until the strike gave an opportunity to close long enough to clean up and make some needed improvements.

Another good property is the Boomerang, which is showing better ore as it is developed, and turns out some good bullion.

In the Queen of the Night, at a depth of 80 feet in the west shaft, three fine veins have been found. At the bottom of the shaft is a rich vein nine inches wide, and another like it upon the side, and a third 18 inches wide in the hanging wall.

Work has also been active in the Lost Horse, Boomerang and Queen of the Night mines.

A number of ch'oriders have been found in the district, but the demand for the miners in the mines has been so great that they have done little for themselves.

Near Indio, on the line between San Bernardino and Riverside counties, there is some activity, and a two-stamp mill is run by a gasoline engine, and when running at its full capacity works up about three tons of ore in twenty-four hours, the ore coming chiefly from the Pivon mountains.

A large number of mining locations have been filed about here, nothing east of the Lost Horse mine. Good float has been discovered west of there. The weather is so hot, though, that it is difficult to do anything at this season of the year.

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DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to **The Correspondence School of Mines, Scranton, Pa.**

NOTICE OF ASSESSMENT.

GOULD AND CURRY SILVER MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given that at a meeting of the board of directors, held on the 27th day of July, 1894, an assessment, No. 74, of fifteen (15) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 30th day of August, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 21st day of September, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the board of directors.

ALFRED K. DURBROW, Secretary.

Office—Room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

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Also Chemicals, and Physical, School and Chemical Apparatus.

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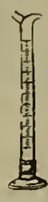

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

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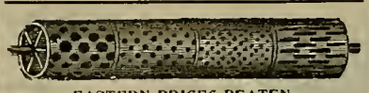

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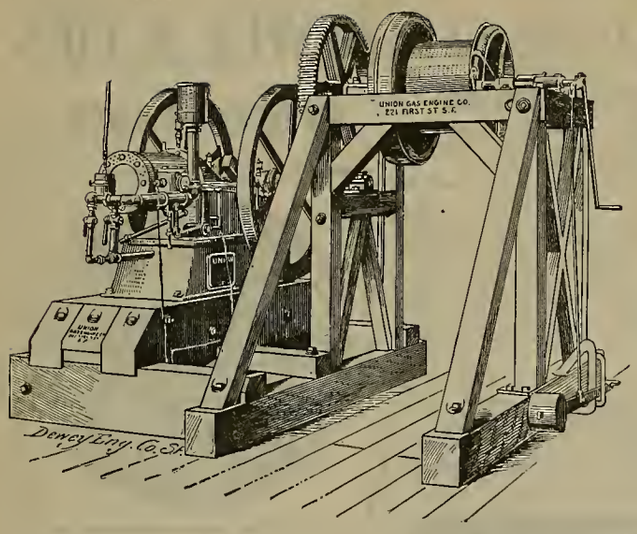

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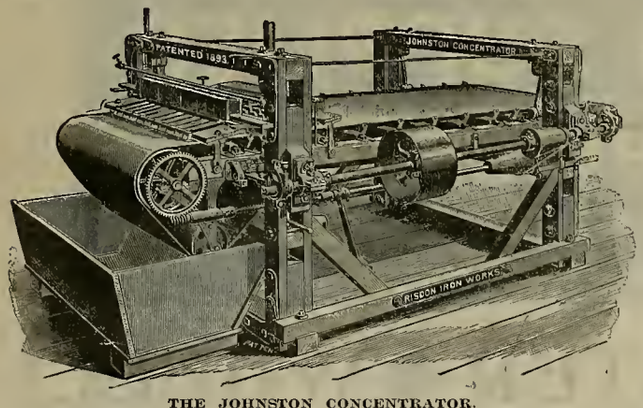

THE JOHNSTON CONCENTRATOR.

THE HUDSON GOLD MINING CO., WARD, COLORADO, June 8, 1894.

RISDON IRON WORKS, San Francisco—GENTLEMEN:—After a thorough test of the Johnston Concentrator, I am so well satisfied that I wired you to ship me two more as speedily as possible. I find the machine well constructed, easily kept in order, requiring but little attention, and doing entirely satisfactory work on our ore. After my experience with other tables, I am congratulating myself on my possession of the Johnston. Yours faithfully,

B. LANGRIDGE, Ph. D., Mining Engineer.

(COPY.) SAN FRANCISCO, CAL., June 1, 1894.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco:

GENTLEMEN:—We have tested the Johnston Concentrator furnished us by you on trial; and after an exhaustive test, we are satisfied it is the best in the market. Please prepare and ship us, as soon as possible, THIRTEEN more machines. Yours truly, APOLLO CONS. MINING CO.

[Signed.] By LEON SLOSS.

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 7.

SAN FRANCISCO, SATURDAY, AUGUST 18, 1894.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

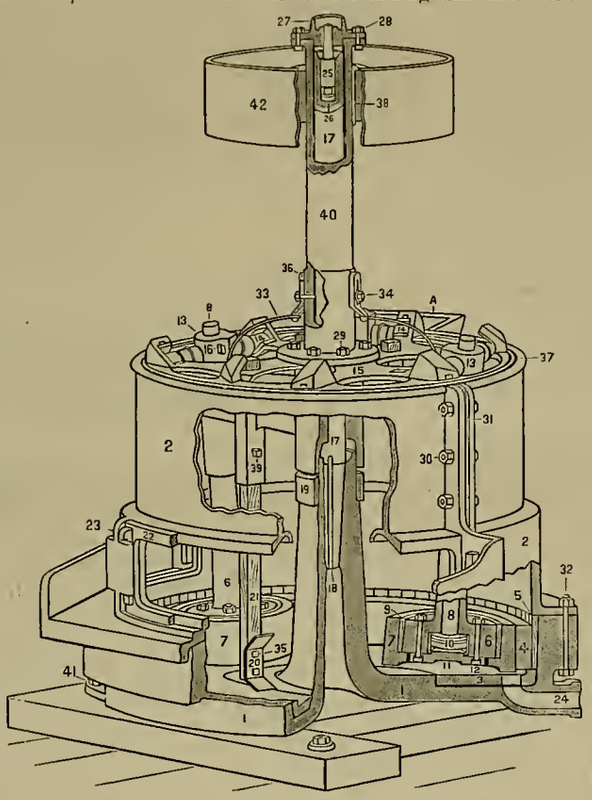
CALIFORNIA STATE LIBRARY

Improved Quartz Mill.

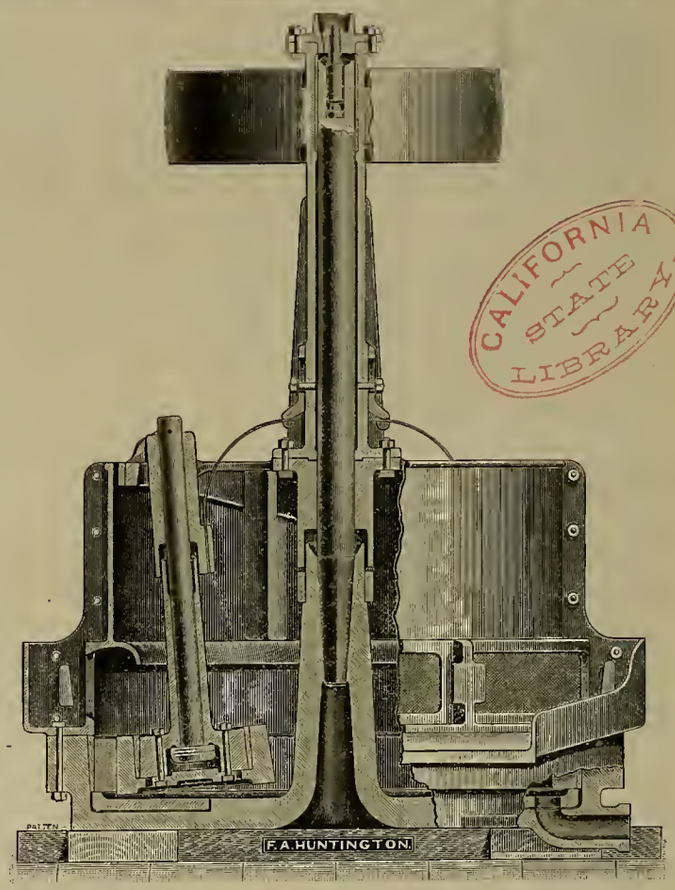
F. A. Huntington has made still further improvement in the centrifugal roller quartz mill. Herewith are given illustrations of the new mill, a general and sectional view being presented. The ore and water being fed into the mill at the hopper, the rotating rollers and scrapers throw the ore against the ring dye, where it is crushed to any desired fineness by the centrifugal force of the rollers as they roll over it.

The inventor says: "This improved mill has the following advantages over my geared mills, viz.: 1. I dispense with the wooden frame with posts, and set the mill on heavy timbers or a concrete foundation, thereby securing a solidity that cannot be attained when set on posts. 2. I dispense with gearing, and drive direct from a pulley. 3. There are five less places to oil. 4. The mill is built much heavier and stronger than the former ones. 5. Being heavier and set on a solid foundation, it can be run much faster, thereby increasing its crushing capacity in the same proportion as centrifugal force is increased by increased velocity."

The mill is manufactured by the Fulton Engineering and Shipbuilding Works of this city.



SECTIONAL VIEW OF NEW QUARTZ MILL.

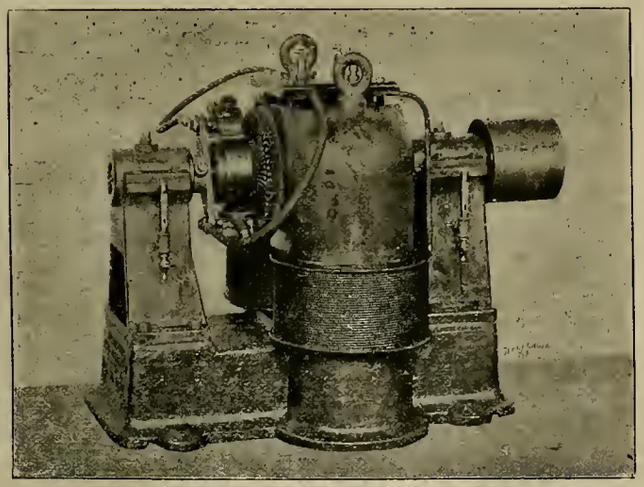


HUNTINGTON'S IMPROVED QUARTZ MILL.

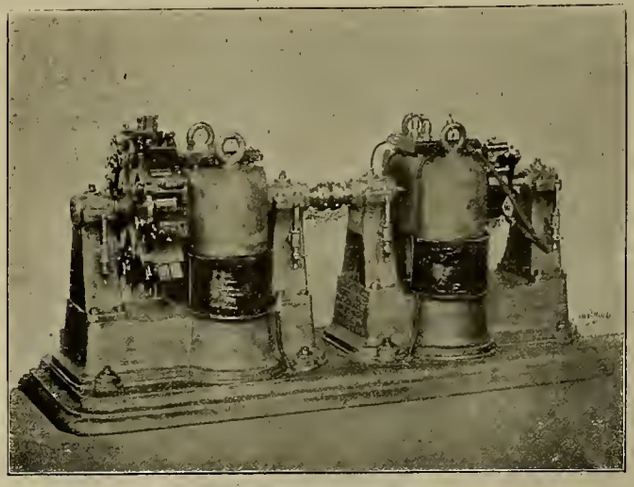
Latest Electrical Devices.

The newest in the way of applied electrical energy is illustrated herewith. One cut represents the new type of the Electrical Engineering Company's motor for mining and mill work. The company has recently completed some large contracts where these machines are in use, notably the 125-horse power transmission plant installed at the Mammoth mine in Madera county. The machines are very compactly built with special reference to durability under hard usage.

The other illustration, while of only indirect interest to the mining world, shows the latest in the line of local electrical progress. It is a unique combination of motor and multipotential dynamo, manufactured by the Electrical Engineering Company of this city for the Postal Telegraph Company. By an arrangement of the brushes of the dynamo any desired voltages may be obtained for the different circuits. Three sets of the machines are in use in the telegraph company's office on Market street, where they have taken the place of the battery cells which were used for charging the telegraph lines.



MOTOR FOR MINING AND MILL WORK.



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Half-Inch (1 square)	1.00	2.50	6.50	22.00
One Inch	1.50	5.00	13.00	42.00

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Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, August 18, 1894.

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The Stewart Mining Bill.

Senator Stewart's mining bill, which passed the Senate about sixty days ago, is no further on the road to become a law. It is to be hoped all efforts in that direction will be as unsuccessful as they have hitherto proved. That the law of May 10, 1872, is defective and unsatisfactory is confessed on all sides; but bad as it is, some of the amendments and changes so persistently urged by the Nevada Senator make matters still worse. There are some good provisions in the bill, but the mischievous clauses so detract from its value as a whole that it leaves the general matter in a worse condition than before.

It is unfortunate both for himself and the cause that he assumes to guide and guard that Senator Stewart is so self-important and apparently so conceited. He declines to accept any modification or change, and practically says "my bill or nothing."

He introduced his bill in '88, but it was unsuccessful. In December '89 he introduced the same bill; he got intelligent communications from California miners and others, criticising the bill in a friendly way and asking that certain alterations and emendations be made. These were almost totally disregarded at the time, but his bill was kept from passing, and in December '90 he brought a third bill into Congress which was an improvement on its predecessors, but not what was wished. The House Committee on Mines and Mining made a very good report on the bill, but the Nevada Senator assumed the role of Sir Oracle and would not have anything done or made or suggested unless it emanated from him. In '91 he introduced his bill again, and after running the gauntlet of the House mining committee, the Senator repeated it in February '92 with amendments. Again it failed, and again its indefatigable author has brought it up. The bill which passed the United States Senate on the 15th of last June is almost precisely the same that he reported in February '92.

The only differences are that where in the proposed amendment to section 2324, in the bill of February 2, 1892, he had a requirement that there should be ten dollars' worth of labor annually performed on each subdivision of a placer claim less than twenty acres, the ten is now changed to fifty; and in the proposed amendment to Sec. 2325, the words "or land that is chiefly valuable for building stone" are left out of the recent bill which passed the Senate.

We would not impugn the Senator's motives; he may be honest, sincere and actuated solely by a desire to render public service; but, ordinarily, stubbornness, tenacity and dogged disregard of courteous and intelligent remonstrance are not characteristics of statesmanship. The sole thing manifest appears to be his great opportunity as a United States Senator. His influence is unquestioned, and it is for this reason an additional regret that interference or counsel are disregarded.

California objects strongly to the Stewart bill, and it is the deliberate opinion of men who have given the subject mature consideration, who have had years of practical experience and observation, and whose station and standing entitle them to respect, that its passage would be an injury to the State's mineral interests and be fruitful only in litigation.

The bill cuts down the amount of placer ground which may be applied for in a patent to forty acres; making necessary an annual expenditure on each forty-acre tract, and additionally requires $50 worth of work annually on each twenty acres. In this regard the Stewart bill may be called "an act to hamper and destroy the drift mining industry of California."

Senator Stewart knows as well as any drift miner in California that that is an unjust provision in his proposed law which makes no distinction between surface and exposed placers, and that would compel a man to first spend $100,000 in tunneling to find a channel or paying lead before he could get a patent or be recognized by the department as having any legal rights. To successfully demonstrate the existence of such channel requires at times possessory ownership of 500 and even 1000 acres, but this would preclude the possession of more than forty under a single patent.

And the same way as to California's petroleum interests. Ordinarily a petroleum tract of only forty acres is not valuable enough to justify the expense necessary to develop it. Senator Stewart is acting in ignorance or defiance of these facts. Any one acquainted with California's industries knows this. Were the pending amendment to become a law it would be a direct blow to the State in several important regards. Perhaps Senator Stewart does not mean that it should, but a measure can only be judged by its manifest effect, and whatever the Nevada Senator's faults no one can justly consider him as wanting in intelligence or experience.

Last October was held in this city the State Miners' Convention. The Stewart bill received full and friendly discussion, and, after due deliberation, a committee composed of men, who, without any derogation to Senator Stewart, know as much about these matters as he does, recommended certain amendments to the statutes in question in connection with and partly amendatory of his proposed amendments. Their recommendations were adopted by the convention with but one vote in the negative. But the work of the convention was ignored by the Senator from Nevada.

"Everybody is wiser than anybody." Pride of opinion and personal self-sufficiency should give way and generally do give way in manly recognition of public rights and public duties, and it is with regret that Senator Stewart's course in this case is observed by many who knew and learned to trust him in the old days, and who even now refuse to believe the suggestions that sordid motives and unworthy personal influences work against his recognition of the broader, brighter aspects of the case. 'Tis always better to understand one another. Nearly all the ill will in this world arises from ignorance of each other's better qualities. In this case co-operation is better than antagonism, but the miners of California clearly see and strongly protest against the unwise and unfair propositions in Senator Stewart's bill, and every honorable means will be used to prevent its becoming a law.

A Decision Reached.

A case of considerable interest to the mining world was decided in the United States Circuit Court last Monday. It was the action between the Wyoming Con. Mining Co. and the Champion Mining Co., involving some points similar to the Amy case. The whole matter was set forth at length, with illustrations of the ground in question, in the MINING AND SCIENTIFIC PRESS of July 14th, '94, and the points of the case need not be repeated here.

The case was tried before Judge Hawley, who delivered the opinion, which was read by Judge Beatty of the U. S. Circuit Court. Both claims of plaintiff were sustained, the injunction granted as prayed for, and a decree made in accordance. The decision in substance is that the plaintiff has a prior title to the Wyoming and Ural mines, and is entitled to 1400 feet of the lode of the Ural trending downward between vertical lines, one extending through the Ural north end line, the other parallel to that line and intersecting the point where the Ural lode crosses its east side line.

The decision is to the further effect that the injunction granted carries with it an accounting. Considerable money is involved in the judgment, which has been awaited with considerable interest, not only at Nevada City, where the mines are located, but in other sections where similar conditions are believed to exist.

At the same time a decision, Judge Hawley's, was read in the case of A. Walrath, the owner of the Providence mine, against the Champion Mining Co., wherein plaintiff asked for an injunction restraining defendants from working south of a certain line, and for damages for ore removed south of such line. (This case was fully set forth and illustrated in this paper in the issue of June 30, 1894.) The decree was in effect adverse to the Providence Company by reason of the curvature of the ledge.

Both decisions are of more than ordinary interest, involving legal questions on property rights regarding mining patents granted under the act of 1866, which had not been heretofore decided. The full text will appear in next week's issue.

Should Be a Law.

The Caminetti bill which has passed the House should become a law. It puts the acquisition of mineral lands on an equality with agricultural lands. As it was in the beginning, is now, and ever has been, the miner had the worst of it, the presumption being all along that all land was agricultural unless the negative was clearly proved. Upon the miner rested all the burden of proof. Ordinarily, when land was taken up for agricultural purposes, the claimant produced witnesses who testified that the land was worth more for agriculture than for mining, and these witnesses usually knowing nothing about mining or mineral land could testify their belief without any show of unfairness. Should objection be raised, the objector had to directly prove that the tract in controversy was mineral land. In ninety-nine cases out of a hundred no one objected, and the patent was issued to the agriculturist. This has resulted in diminishing the actual mineral area for prospecting purposes, for once a United States patent is issued the miner has no more to say about that particular one-fourth section, no matter where it is. The tract may be plainly mineral land and good ground for prospecting, with valuable ore in sight. There is no redress. No one objects to the farmer getting every rod of government land in this State or any other, but the existing law's unfairness is manifest. There is more agricultural land than mineral land in any State of the Union. There are counties in this State where what is plainly mineral land is held by farmers under United States patent, proved up on as agricultural land. The bill which has passed the House, and which is in a fair way to become a law, corrects this existing injustice. It is not retroactive. It does not take away from the men who have acquired legal title thereto the thousands of acres that could to-day be mined for gold and silver were the facts in the case fairly stated at the beginning, but it will prevent future perversion of the public domain.

SOME time ago the South African gold-mine managers thought it would be a good idea to have a competitive exhibition of concentrating appliances, and a committee was appointed with power to act. In the course of investigation some of the committee arrived at the conclusion that concentration was not necessary at all, and from this premise naturally followed the deduction that the proposed competitive exhibition was unnecessary. The committee finally made a report in which it is guardedly stated that varying classes of pyritic ores have to be concentrated. The cyanide solvent seems to have cut some figure in the discussion, but it is probable the committee will finally conclude to relegate their theories to the business in hand and bold the proposed competitive exhibition.

The Battle Ship Oregon.

The preliminary trial of the new battle ship Oregon took place last Wednesday, the vessel leaving the Union Iron Works in command of Captain Minor Goodall. She was not pushed, the intent being simply to give the motive power a chance to revolve. She went under slow bell to Hunter's Point, Red Rock and back to her moorings. Everything worked satisfactorily.

This was in no way an "official" trial trip, the date of which cannot be announced. The Union Iron Works is ready, but the Government is not, and till the armor belt plates and turret plates are received her builders can only wait. It may be a year; it may be longer. At her official trial a speed of fifteen knots must be made, but her builders are confident a speed of seventeen knots can be registered. Of coure that would mean another handsome bonus to her enterprising builders. Recently the Minneapolis earned $400,000 premium for her builders by the speed displayed at her official trial, she being now the fastest war ship in the world.

Regarding this matter of premium on war ships, about which a good deal has been asserted by several unacquainted with the facts, it may be said that while the "premium" or "bonus" of $400,000 to the Cramps of Philadelphia, or of $300,000 to the Union Iron Works of this city, is a large sum, yet it by no means represents profit. It may also be said that the Government exhibits good business sense in offering such premium for every quarter knot excess of the required speed. A battle ship is valuable in exact proportion to her speed. Her ability to overhaul or get away from an enemy is of prime importance. When a great firm gets a contract for a great vessel, it puts increased cost in every bit of work to earn the premium, not alone for the money but the credit, the renown. Without such incentive the official minimum would be just reached. The Government gets all it pays for when it pays the bonus, for the vessel turned over is well worth it. No firm would like to take a big contract with a possibility of failure, but when it is seen that the expenditure of several thousands more than the specifications or estimates require may result in increased speed, the money is put on the vessel and the Government gets the good of it. That is to say, in the case of the Oregon, were the Union Iron Works required to make that vessel develop seventeen knots at her fortheoming trial they could not or would not have put in the bid they did for her construction at a required fifteen-knot speed. And it is probable that they or any other firm able to do the work would have had to make their bid higher than the amount of the possible Government bonus in order to meet the greater requirements. So that, after all, the "premium" is only part of the price the Government pays for a vessel that is proved to be worth it, and that "premium" by no means represents clear gain to the builders, for they have already spent a large share of it in making its receipt possible.

Personal.

PETER H. BURNETT, the first Governor of California, registered with other fellow citizens last Wednesday, to vote at the next general election. The old gentleman resides at 1713 Larkin street, this city, and is in his 86th year. He and Romualdo Pacheco are the only ex-Governors living who were elected under the old Constitution. Senator Perkins and General Stoneman are the living ex-Governors elected since the present Constitution went into effect.

COL. D. H. JACKSON is back from a lengthened sojourn on the Atlantic slope. It is his intention to develop the Chinaman mines at White Pine, Nev. He says that, although there is abundance of money in the East, it is a matter of present difficulty to enlist the attention of capital in any mining project, however worthy. As elsewhere, the business world needs a strong dose of faith cure more than anything else. Many there now think that the continued bear movement on silver injures the general course of business, and have considerably modified their views on this matter since the beginning of the present stringency.

Clipped and Condensed.

THE King of Siam is dead.

THE Japanese continue victorious in the China-Japan war.

THE Senate tariff bill has passed the House and awaits the President's signature.

CASERIO, the anarchist assassin of President Carnot, was guillotined at Lyons, France, last Thursday.

A PROTOCOL has been signed uniting Guatemala, Nicaragua, San Salvador and Honduras into one republic. Costa Rica was also represented at the conference, but that Government has declined to sign the protocol.

Concentrates.

THE Merrifield mine at Nevada City is being reopened.

THE Silver Grey mine, in Trinity Co., is to be started up again.

THE mines of Aspen, Col., are shipping 6000 to 8000 tons of ore per month.

THE Denver assayer expects to take in $1,000,000 in gold during this month.

THE Royal gold mine in Granite Co., Montana, will resume operations and dividends September 1st.

THE Resources mine of Sweetland, Nevada county, is to be developed, machinery now being on the way.

THE Defiance Mining Company is incorporated at Austin, Nevada, to exist for fifty years; capital stock, $1,000,000.

UNDER the superintendency of George Mainhart, the Ione, Galena and Bullion mines in Grass Valley district are to be worked.

THE case of W. W. Rodehaver, charged with embezzling the funds of the Placer County Miners' Association, was dismissed at the preliminary examination.

BODIE mining companies had cash on hand on the 1st, as follows: Bodie, $81,661.04; Standard, $33,315.35; Mono, $2063.98; Syndicate, $914.86; Bulwer, $4647.14.

C. D. LANE has a $25,000 bond for three years on the Giant King mine, two miles from Washington, Cal. Considerable work will be done and a mill erected.

THE Cumas No. 2 gold mine, near Hailey, Idaho, has been pumped out and a sufficient force of miners employed to keep the twenty-stamp mill running right along.

ON the Metlakatlah Indian reservation, on the Northwest coast, where gold was recently discovered, the Indians and the miners ask for protection from each other.

NOT to be outdone in gold discoveries, Chicago now announces gold quartz "visibly rich" in the big drainage canal now being dug from that pleasant prairie city.

THE Kennedy *New Era* says that that town is the only one on the coast that is not supplied with a drugstore (bleached) blonde, and the people are correspondingly elated.

THE Sebastopol mining property is now being worked by the Sunrise Gold Quartz Mining Company, with W. E. Lawton as superintendent. A hoisting works is being erected.

THE Denver mine at Forbestown, Cal., has shut down. About forty men are temporarily out of work. The bond on the property has expired and the leasers did not want to buy.

AT Frisco, Utah, it is thought that the work of rebuilding the Horn Silver hoisting works and concentrating mill, which were destroyed by fire last spring, will be completed about the 20th inst.

THE Gold Bank Tunnel Company at Forbestown, Cal., has just commenced to drive a 1200-foot tunnel in from the Feather River side. The company expects to erect eighty stamps more in the near future.

THE *Lode* of De Lamar, Lincoln county, Nevada, says that a deed was recorded during the week for an undivided one-half interest in two valuable mining properties from a gentleman to a lady, the consideration being "love, affection and $100."

ALL the hydraulic ventures about Kamloops, B. C., have been hinging on the developments of the Horsefly and Cariboo hydraulic mines. Word is received that the Horsefly cleaned up $4880 in 106 hours' work, and the Cariboo $5100 in 47 hours' work.

SOME Chinese gravel miners on Greenhorn creek in the neighborhood of Hunt's Hill, Nevada county, take out about $5000 every three months. The *Transcript* says they wash the gravel three times, thus obtaining about all the gold there is in it.

THE receipts of gold bullion at the United States assay office at Helena during the past week amounted to $120,088.74. This is the largest week's business in the history of the office, not only in amount, but in number of bars melted and assayed, 130 being handled.

THE Denver *Record* wants the General Government to offer $250,000 reward to the inventor of a cheap, successful process that will enable owners of very low-grade ores to handle and treat them at a profit. It might do, and often does do, a great deal less practicable work.

THE two San Francisco lawyers, who are suing the Comstock Tunnel Company for $9000 attorneys' fees have attached all or nearly all of the real and personal property in Lyon and Storey counties. The attachment covers about $75,000 worth of property, which includes ranches at Sutro and money in possession of debtor mining companies.

THE Mercur Mining & Milling Company of Mercur, Utah, has decided on the erection of a new mill, using the cyanide process, of 200 tons daily capacity. It will be double the capacity of the old mill and located close to it. New and improved machinery will be a feature of the new gold mill. The management decided to furnish all materials and let contracts for the labor.

THE Butte, Montana, *Inter-Mountain* recalls the fact that the Anaconda mine was sold to Daly & Haggin in June, 1881, for $30,000 by the Hickey Bros., and was considered a doubtful proposition then. In September of 1881 the St. Lawrence, an adjoining property, was sold for $162,500. These two properties, which a little over ten years ago sold for less than $200,000, are now considered second only in amount of ore produced and value of any in the world.

THE manager of the DeLamar mine, Idaho, gives the Boise *Statesman* the following, showing the output for July:

Ore crushed, 3715 tons 66 pounds.	
Amount realized	$70,484 32
Ore shipped	5,500 00
Revenue from other sources	2,110 32
Total	$78,094 64
Expenses	34,499 85
Estimated profits	$43,594 79

A Moseo, COL., dispatch says: The excitement over the recent gold find has been intensified by the discovery of rich float ore extending over a very wide territory, and many who have visited the field are making arrangements to remain permanently at the new field. A new town has been started and called Blanca. Buildings are in process of erection, and a stake line is running to the field. An assay of ore, selected with a view to avoid rich pockety formations, averages $700 to the ton in free gold.

THE Nevada *Transcript* says: Superintendent Blundell has a crew of ten men working at the old Murchie mine and is preparing to resume active operations before long. An upraise from the drain tunnel in the Alice Bell location is being made, and the company will shortly erect new hoisting works. The old Murchie mill, on Deer creek, which has been idle for ten years or more, is being repaired and put in running order. It is proposed to work the mine thoroughly and economically.

A. H. WARD has sold to the Sierra Butte Mining Company in Mariposa county the Whitlock, North Whitlock and Westward mining claims, the Whitlock, Spencer and North Whitlock mill sites, and the water location of A. H. Ward on the Merced river. About 240 acres of land were conveyed in the transfer. The Spencer, Alabama and a number of other mines contiguous to the Whitlock have been bonded by the same company, and they will probably be purchased before the expiration of the bonds.

THE production of copper throughout the world in 1893 has been given at 17,250 tons for Germany, 160 for Argentine Republic, 1425 for Austria-Hungary, 7560 for Australia, 2500 for Bolivia, 4000 for Canada, 6090 for Cape Colony, 54,270 for Spain and Portugal, 147,210 for United States, 21,350 for Chili, 400 for England, 2040 for Newfoundland, 2500 for Italy, 18,000 for Japan, 8480 for Mexico, 460 for Peru, 5000 for Russia, 750 for Sweden and 2850 for Venezuela. This makes a total of 303,975 tons, against 310,845 in 1892, 279,491 in 1891, and 269,630 in 1890.

DIRECTOR WOLCOTT of the Geological Survey has submitted his plan of operation for the present fiscal year to the Secretary of the Interior, who has approved it. Special attention is to be given to the survey of the mineral-bearing areas of Colorado, Idaho and California. The topographic work will be carried forward in twenty States, a large share of attention being devoted to the arid region of the interior and to the Pacific coast. Thirty-two topographic parties and twenty-seven geologic parties will be in the field, five of them being employed in the Rocky mountains and their foothills.

IN British Columbia a prospector is required to take out a license, which costs him $5, and he pays $2.50 for recording his claim. He is allowed to make two locations in a district. Claims are located 1500 feet square and no discovery is necessary before a location is made. A discovery must be made, however, within fifteen days after the date of the location. One hundred dollars must be expended on each claim every year. When $500 worth of work has been done on a claim, a crown grant, equivalent to our patent, can be secured for about $100. After that the Government requires the payment of $20 a year on each claim.

FOUR new mining companies filed articles of incorporation in this city last Wednesday, as follows: Western Investment Company, for mining purposes; capital stock, $100,000. Directors—Theodore Savage, George E. Stoker, J. F. Bourke, E. C. Marliave and D. E. Besseker.——Shamrock Mining Company; capital stock, $250,000. Directors—M. S. Reid, S. W. Backus, D. McPhee, M. J. Farrell and N. T. Bell.——De Soto Gold Mining Company; capital stock, $300,000. Directors—Irwin C. Stump, E. H. Clark, W. R. Hearst, Joseph Clark, F. G. Dunn, Arthur H. Wallace and Thomas Turner.——Crescent Mining Company; capital stock, $1,000,000. Directors—W. C. Stadtfeldt, A. K. Durbrow, H. B. Havens, Jacob Stadtfeldt Jr. and A. W. Havens.

THE California Debris Commission was at Volcano, Amador county, last week, to inquire why Sutter creek at Ione held in suspension so much debris. The miners in the neighborhood were notified to cease operations and await the report of the commission. It is thought restraining dams and settling reservoirs will have to be built. As hydraulicking in that section is on so small a scale this will hardly pay, and the waste water which originally comes to Volcano and into Sutter creek for mining purposes will not be taken up, with the result that the volume of water running down Sutter creek will be reduced. At last Wednesday's meeting in this city a permit was granted to the Hustler mine at Cherokee, Butte county, to wash one-half acre of ground. Several applications from Plumas county are still pending.

ANDREW HIGHTON has been arrested in Boston charged with passing worthless checks. He tells conflicting stories, among them that he belongs in Portland, Or., Denver, Col., and Baker City, Or. He says he is one-fifth owner of the Ornament and Surprise mine on Greenhorn mountain, Grant county, Or., and is in Boston to secure capital with which to work the mine. He called at the National City Bank and offered for deposit a draft for $15,000 drawn on N. Clarnel of Seattle, who, he says, is a half owner in the mine. When he presented the draft he told the cashier that he did not want it collected until the last of the month. The bank promised to accommodate him in this respect, but informed him that he would not be given any money until the bank had sent the draft West for collection. Highton went to Portland last April. He bonded the Ornament and Surprise mine in Grant county, and went to Colorado by way of this city to secure a twenty-stamp mill to put in the mine.

THE interest taken in South African and other mines is not confined to the British Isles. The London *Mining Journal* says the monthly returns are watched in Berlin and Paris with keenness, and the probable rise and fall of prices is considered as mathematically as it is in London. The operators abroad may not, however, be quite as cognizant of certain facts about African mines, and those of India to a lesser extent—that they are controlled by cliques and syndicates, and that the only chance the public has of operating is, not upon the merits of the mines, but by buying fairly promising shares which seem to be unduly depressed and selling them at the time when the cliques and syndicates are busy at what they call "making a market." In fact it comes to this, that, as on the turf, you bet primarily upon the character of the jockey and secondarily upon the merits of the horse; in dealing with Randt shares you put your money on the cliques and syndicates, and only in a minor degree on the merits of the mines. Of course, the syndicates like something to go upon. A good return, a timely discovery, a glowing report will probably be the basis of their operations, but the real merits of the mine are the last in their thoughts, and the market price of the shares the first,

A Colorado Gold Mine.

NO. II.

The incline shaft is driven down on the natural dip of the vein and in the vein, whose inclination is sixty-eight degrees from the horizontal.

The incline system of shafting on a vein is the best system in medium-size dipping veins, when the incline shaft is wholly in the vein and occupies its whole width, together with, if need be, part of the wall work as well. But in a very wide vein, particularly if it is all pretty rich, the vertical shaft is preferable, especially, too, when a great amount of haulage quickly to the surface is required.

If need be, the shaft may be located wholly outside the vein in the country rock, both in inclined small veins and vertical large veins, running close to and parallel with the vein, and reaching the vein by short cuts. This is more especially advisable when the vein in question is very valuable throughout its entire thickness.

In the Bassick is an example of a wide vertical shaft at Silver Cliff, Col. The shaft having been put down vertically in the center of this very valuable vein, when all the valuable material was worked away around it, there was little left to support the shaft but its own woodwork. It would in this case have been better to have put down a vertical shaft wholly outside of the vein, and have reached and won the ore deposit by short crosscuts from it. If an incline is put down on a wide, sloping vein, it should lie directly on the footwall, as in the present instance. On the other hand, the disadvantages of a vertical shaft cutting a dipping vein is that when great depth is attained such long and expensive crosscuts have to be made through dead work to reach the vein.

This was the case in the present instance. The

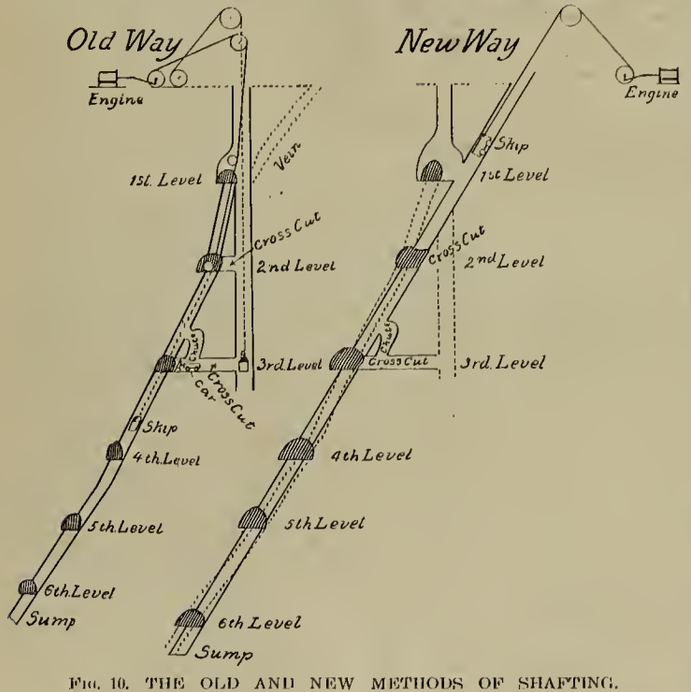

FIG. 10. THE OLD AND NEW METHODS OF SHAFTING.

original owners were old Comstock miners. This mine was developed by the vertical shaft and crosscut system, and so they applied the same system to this vein, but at 500 or 600 feet depth the expense of 100-foot crosscuts was very great. So a compromise was attempted between an incline and a vertical shaft, as shown in Fig. 10. This involved some two or three times handling of the ore, and by this system a loaded skip took about half an hour coming up to the surface from the bottom level.

The present manager concluded to abandon the old shaft and reopen the mine by the present incline, following the dip of the vein. Now the loaded skip comes up to the surface in less than a minute.

The friction on the machinery wheels, etc., of an incline are of course greater than on a vertical shaft, but expense, time and labor are saved, and ore is being taken out all the time instead of a perpetual system of dead work.

At the bottom of this incline shaft is the sump—a tank for mine water twenty-five feet square. A continuous stream of rusty, mineralized water pours down the side of the incline, receiving contributions from the outlets of the different levels, whose floors incline gently at a grade of ten inches in 100 feet toward the shaft on either side. The water drains from them by a gutter on the side of the rail track. This fissure vein, as in many cases, is the natural course of a spring. The water that pours down it is not mere seepage surface water, but a living spring in the vein itself.

At the foot of the incline, close to the sump, is a large pump for pumping up water from the sump through a bronze pipe, composed of brass, tin and alumina. This pipe is about five inches in diameter and cost $4 per foot, and with putting it down $5000. This expensive pipe was found necessary, as iron pipes were so rapidly eaten up by sulphuric acid, sulphate of copper, vitriol and other metallic acids of the ore.

In the sixth or bottom level, along the footwall, modern deposits of green sulphate of copper and red oxide of iron and other metalliferous minerals, combined with solutions of lime and silica, were seen, laying the foundations of a future and modern vein.

In these damp levels the destruction of iron work is extraordinarily rapid, and the expense of replacing iron pipes carrying air to the drills, etc., is great. These pipes have to be propped up above the wet ground. An iron shovel left only a day in these acid waters is ruined.

Such mine water, it is obvious, could not be used to feed boilers for steam purposes.

In the third level, at a point directly under the bed of the river, there is a good deal of moisture as well as a large ore body, and the deposition of iron oxide and copper sulphate in belts and streaks was very marked.

In this third level the dike of porphyry we have alluded to makes a sudden bend and, leaving the hanging wall, cuts directly across the vein, slightly faulting it. The vein matter does not pass through it.

In part of the third level, towards the south, which is neither dry nor wet but dampish, are great quantities of fungus adhering to the old stulls or woodwork, which have a rotting tendency like dry rot. It hangs down in festoons like white rags, or even coats the side of the mine with a white crust; it burns when a candle is applied to it, with a disagreeable smell.

This fungus is a fertile source of decay in old workings that are somewhat dry; on the other hand, timbers in the wet drifts saturated with mineral water are almost imperishable. These timbers are so water-logged and saturated with metalliferous solutions that they may be considered in a sense fossilized. An axe will hardly touch them, and doubtless if they were burnt something like a cast or replacement of the original fibers of the log would be found preserved in a metallic state.

In the third level was an instructive example of faulty timbering and of the importance of putting in timbers *just right* from the start. The stulls here, as in the other levels, are exposed to enormous lateral pressure from the hanging wall and are cracked, split and crushed; but, unlike the newer timbering, we observed these stulls to be frequently out of place, bent inwards, and in consequence that they had been propped up in all sorts of ways by the recent management to keep the level open. This was partly owing to the decay and age of the old stulls, but mainly owing to their not having been properly laid. The slope they preserved, to begin with, was too flat, and the butt ends, instead of being fitted into hitches, lay against the bare walls or rested on upright props, and their line of juncture with these props was so fixed that they would easily slide when

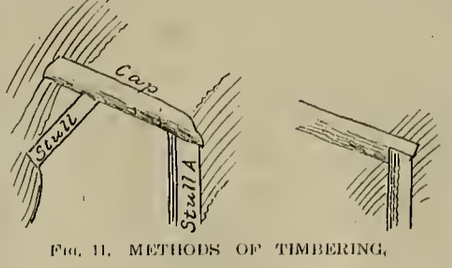

FIG. 11. METHODS OF TIMBERING.

the pressure was applied (see Fig. 11). Large pockets of ore had been opened up in big caves toward the end of this level.

To the north this level passes under the bed of the creek, yet strange to say but little water seems to seep down from this source. In excavations in the bed of the creek, they found that an impervious layer of clay lined the bottom. A large chute or body of ore occurs, however, beneath the creek; further on the level passes beneath the crest of the mountain and another ravine on the surface.

Near the end of the level is a rope ladder about seventy feet long leading into a stope, where, on the contact vein, the usual line occupied by the mineralized breccia gangue was filled by a solid mass of barren porphyry, beneath which, between the porphyry and the granitic footwall, lay the usual layer of rich smelting ore, composed of solid pyrites and bornite or purple copper, constituting a true "contact" vein between porphyry and granite. The ore below water level, that is, below the level of the creek, loses all its decomposed oxidized character and becomes solid unoxidized ore.

The ore-sorting room, 50x25 feet, occupies the upper story of a tall building; in the lower part are the bins and ore chutes, into which the sorted ore and refuse are thrown. The former is either wheeled to the mill for crushing, stamping and concentrating, or passes directly through chutes into the railway car, to be shipped to Denver for smelting. The mouth, or top, of the incline shaft comes directly up into this ore-sorting room, at the back end, and dumps its cargo of ore through a screen called a "grizzly" on to the plates and bench of the ore sorters, and its useless rock into a bin connected with the outside, where it is trammed off in a car to the dump.

The sorting room is lofty, and an open little house or skylight on the roof receives the wheel and top of the incline shaft. The position of the shaft scaffolding is seen in our sketch (Fig. 12) rising above a plat-

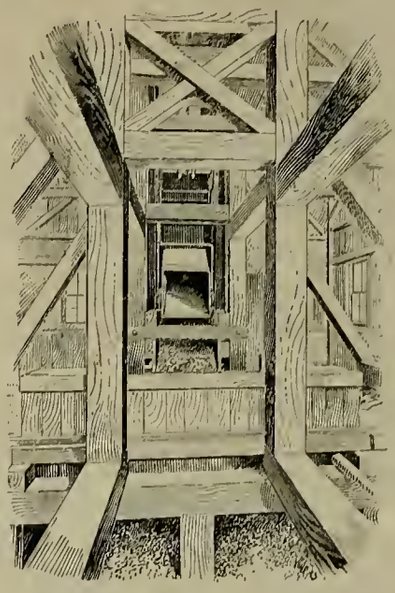

FIG. 12.—DUMPING ORE INTO THE SORTING ROOM.

form, standing about ten feet above the ore-sorting floor beneath. Material for the mine below is drawn up by the rope to the point A where the skip runs out on a horizontal rail, and automatically dumps its load (Fig. 13) on to the deflector B. This deflector

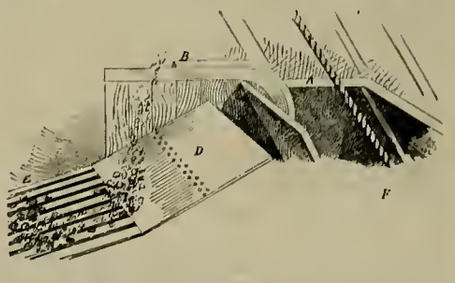

FIG. 13.—DUMPING ARRANGEMENT ON PLATFORM HEAD OF SORTING ROOM.

or apron is a plate of iron, swinging in a sloping direction on a pivot so that it can be reversed as needed. Thus, when the skip brings up a load of ore it falls on the apron and passes over the screen or grizzly D, its larger pieces falling on to the sorters' table E on the floor of the room, and its finer stuff passing through the grizzly into a bin or chute below for immediate transfer to the mill. If, again, the skip brings up only dead rock, the apron is reversed and the rocks are discharged down the open space F to be carted to the dump, so no time is lost.

As the mass or blocks of ore-bearing rock pile up on their table, the ore sorters, two or three men, select pieces and break them up with hammers, distinguishing by long practice the different values.

The material divides itself into three or four grades.

1st. Useless rock barren of ore.
2d. Concentrating or middle-class ore.
3d. First-class rich smelting ore.

The concentrating material is shoveled without much sorting into a mill hole, one of three in the floor, in a somewhat wholesale manner, as this class of ore preponderates, but from it is selected the first-class ore. This is put carefully into wheelbarrows, wheeled to a scale at the farther end of the

room, weighed up to 400 pounds and dumped down a separate chute.

Often pieces of ore will contain half poor scattery concentrating ore and rich smelting ore in the same piece. The sorter with his hammer breaks off the good from the medium, and throws the latter into the mill hole for concentrating matter

Besides this, is an intermediate class of large blocks, containing dead rock and some ore, which are piled up in heaps on either side of the room and are called "cobbing" ore, which the sorter cobs with

FIG. 14.—ON THE FLOOR OF THE SORTING ROOM.

his hammer at his leisure, extracting the good ore and throwing the barren rock down the rock chute. The sorters have each a box beside them, in which to put very valuable ore prior to its being wheeled away. An ore sorter requires to be one who by long habit has become acquainted with the surface look of ores of the mine, and can tell at a glance, pretty nearly, whether it is to be classed as first or second-class ore.

In some mines, as in the present one, where the distinction of the ores is very marked, ore sorting is not difficult, but in others, where the values are very much obscured, it takes an old hand to discern between good, bad and indifferent, and even the oldest hand is liable at times to throw aside a valuable piece of ore. However, the latter, unless thrown among dead rock, is not wholly lost if it finds its way among the lower grade concentrating ore, because it only goes to further enrich the concentrates above their average.

Through the mill holes the ores drop into the chute bins, and pile up there, until the railway car comes along, at the bottom of the building. And then a series of iron doors called ore chutes are opened by

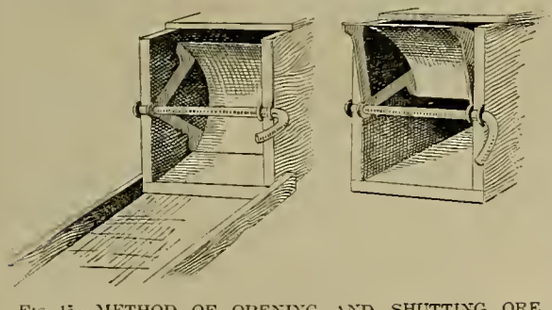

FIG. 15.—METHOD OF OPENING AND SHUTTING ORE CHUTE.

a bar and the ore pours into the box car ready to receive it. Fig. 15 shows the method of opening and shutting the ore chutes.

Mines in Good Shape.

Several Salt Lake men well posted on the silver and lead mining situation in Utah tell the *Tribune* that at no time have the old producers, as well as the new ones, been in a better shape for yielding up their treasures than at the present. For the last year or more the work has not been profitable, owing to the depression, but the showing made in nearly all the various mines are such that with higher quotations on silver and lead the output of the Utah mines would at once be double or treble the old-time figures. The opinion is quiet general that silver and lead will yet bring the good old prices before the depression came on and tariff tinkering commenced. There are many who believe that these metals will soon be restored to former prices, and with this conviction fixed in their minds are pegging away at silver and lead mining propositions in a stouthearted manner, with a sublime faith in the future.

The Coming Golden Era.

TO THE EDITOR:—When we consider that gold is the standard of all values, and as such is the life-blood of mechanical energy, commercial activity, and the great patron of art, we see at once the most important part this metal plays in the affairs of life. And here I will say, that while I speak thus of gold, under a proper financial decree silver would play its part equally with gold in its power for good in advancing the comforts of mankind.

History shows conclusively that when and wherever the precious metals were lavishly produced and distributed, the world's affairs dashed ahead at a corresponding ratio. It shows, too, that we must mine for the precious metals to maintain our wealth and civilization, or change our standard of value. What the past has done in the production of precious metals history in part records. What is in the future in this respect, and what it can be made to be, as excelling all past records, simply depends on the will of the masses to mine.

The acreage of the United States, British Columbia, Mexico, Central and South America, Russia, and the Australian isles and South Africa is of such extent that the mining world need not be idle for want of fields to engage in, for a thousand years to come, and that there is opening a spirit for mining for the precious metals, the worldover, is apparent to every one familiar with the business.

The cause is clear. The introduction of machine drills, whereby two or three men can perform the duty of ten times their number, the use of such effective explosives as dynamite, etc., etc., taken in connection, render the cost of displacement of ore hardly ten cents on the dollar to its former expense. The perfectness of mill machinery and the application of electricity to distant water powers, and to all departments of mining, becomes another great factor in lessening the expense of reduction.

Then comes the fact that science and practice in the manipulation of ores and metals have become so complete that the yield of per cent is, on the average, nearly double that of twenty-five years ago. Thus, the causes of failure in the past are apparent, and the successes of the future are assured; and hence I am led to say that the golden age of the world is not in the past but in the future, and what it may be made to be simply rests on the will of capital. The past was the product of muscle more than money. The future is more a matter of money than of muscle.

Having spent the greater part of my business life in mining, I presume to make the prediction, as through the telescope of these extended years, I see the golden aurora of the future.

To give weight to this idea of the coming golden era, we have only to figure back a single decade.

According to the best authority, Director Preston of the United States mint for one, the world's yearly gain of the precious metals has been as follows, and we will only take the past six years for figuring out the future, which will be found as follows:

	Gold.	Silver.	Total.
1888	$110,775,000	$124,281,800	$235,056,800
1889	123,489,000	142,150,000	265,639,000
1890	118,848,700	172,234,500	291,083,200
1891	126,183,500	186,446,800	312,630,300
1892	146,267,000	197,220,500	343,527,500
1893	155,521,700	207,895,400	363,417,100
1894	170,000,000	180,000,000	350,000,000

In my estimate of $170,000,000 of gold for 1894, I think when the statistics are made up at the end of the year these figures will be found below rather than above the mark.

Now, when we see the product of twenty years ago (1874), which was $90,750,000 gold, $71,000,000 silver, and total $162,250,000, we can grasp the great strides being made in the production of the precious metals.

A glance at the column of the silver product shows in unmistakable clearness what a prosperous people we might be were the banking powers throttled in their efforts to fully demoralize silver.

Silver is the money of the multitude the world over, and the multitude must battle for it unceasingly; any curtailment of the precious metal product is retrogression, and even though we see a great building up of the gold returns, there is no reason in this, that the world's production should be deprived of its silver wealth.

As before stated, the more we mine, the more metal produced, the higher in the scale of civilization we move, as wealth gives the power to gratify enlarged desires, and enlarged ideas is human progress. ALMARIN B. PAUL, M. E.

San Francisco, August 15, 1894.

The "Attraction Particle."

Professor Schaefer announces the discovery in each tiny animal of a cell containing life, or what he terms the "attraction particle." When biologists discovered the cell principle of life they thought it impossible to subdivide these infinitesimal atoms, but the microscope has shown the existence of this small particle in each cell, which is itself a structure *sui generis*, having definite existence and a definite function of its own. It is almost as minute an object as it is possible to conceive. In the cell, which is magnified 1000 diameters, the central particle appears merely of the size of a pin point. Yet this almost infinitely small object exerts an extraordinary influence over the whole cell, which may be many thousand times its size. It initiates and directs those processes which result in the multiplication of cells, and indirectly, therefore, it is concerned in directing the general growth of the individual and ultimately the propagation of the species. It is shown, then, that the principle of life is contained in a particle a thousand times smaller than the smallest object which the best microscopes of a few years ago were able to perceive, and the latest name for the dissolved mystery of life is "attraction particle."

Ups and Downs of a Miner's Life.

The ups and downs of a miner's life are well illustrated, says the *Colonist*, in the career of William Barker, for whom the town of Barkerville was named, and whose funeral took place recently from the Old Men's Home, where for months he has lain seriously ill. The deceased was a native of Cornwall, being in his early life a sailor. He came to British Columbia in 1858, one of his shipmates on the long voyage round being the veteran Robert Ridley, who also shared with him the adventures and varying fortunes of his life in the mines. In partnership with the late Bob Dexter, Barker's profits for a few months ran into thousands of dollars a day, but so free was he with his money that he saved nothing for his declining years. To "Bill Barker" belonged the honor of sinking the first shaft "below the canyon," and at one time his fortune was counted by the hundreds of thousands.

The Lead Trust.

The Lead Trust was formed eight years ago with a capital of $90,000,000. It ran against the law in so many places that it dishanded about four years ago and was reorganized under the laws of New Jersey with a capital of $30,000,000. It tries to restrict the output and dictate prices to both the consumers of the finished product and the producers of the raw material. It took the Morey lead works in Cleveland, O., closed the works, discharged the employes, left the plant useless and raised the price of white lead to the people of Cleveland. It was that Lead Trust which caused the reduction of one-half the tariff on lead in the Wilson bill.

RECENT MEASUREMENTS show that Mt. Ranier, Washington, is 15,539 feet high, about 1000 feet higher than was supposed.

The Mineral Hydrocarbons.

NUMBER X.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

While it has been shown that natural gas has been known from the date of the earliest historical record, and was in use by the Chinese almost from time immemorial, yet it was unknowu iu Europe until the 17th century.

The physical properties of gas were also unknown until the time wheu the vagaries of alchemy were changing to moderu chemistry. The alchemists taught that metals were individuals and that the gases escaping duriug manipulation were their souls, which they were at first called. They were afterward named "spirits," a term still retained and applied to alcohol and certain other volatile substances.

Natural gas was discovered iu England about the middle of the seventeenth century, as far as I can learn.

In the Philosophical Transactions for the year 1667 (Vol. II, fol. 482) may be found the following paper by Thomas Shirley after returuing from a journey in 1659, in Lancashire, England:

"The people of this town (Wigan) did confidently affirm that the water of this spriug did burn like oyle, into which error they suffered themselves to fall for want of a due examination of the following particulars: When we came to the said spring and applied a lighted candle to the surface of the water, 'tis true there was suddenly a large flame produced, which burued vigorously, at sight of which they all began to laugh at me for denying what they had positively asserted. But I, who did not think myself confuted by a laughter grounded upou inadvertancy, began to examine what I saw, and, observing that this spring had its eruption at the foot of a tree growing on the top of a neighboring bank, the water of which spring filled a ditch that was there and covered the burning place lately mentioned, I then applied the lighted caudle to divers parts of the water contained in the said ditch, and found, as I expected, that upou the touch of the candle and the water the flame was extinct. Again having taken up a dishful of water at the flaming place, and held the lighted candle to it, it went out; yet I did observe that the water at the burning place did boyle and heave like water in a pot upon the fire, though my hand put into it perceived it uot so much as warm.

"This boyling I couceived to proceed from the eruptiou of some bituminous or sulphurous fumes, considering this place was not above 30 or 40 yards distant from the mouth of a coal pit there. And, indeed, Wigan, Ashton and the whole country for many miles compass is underlaid with coal. Then applying my hand to the surface of the burning place of the water, I found a stroug breath, as it were a wind, to bear against my hand.

"Then I caused a dam to be made, and thereby hindered the recourse of fresh water to the burning place. I caused that which was already there to be drained away, and then applying the burning candle to the surface of the dry earth at the same point where the water burued before, the fumes took fire and burned very bright and vigorous.

"The cone of flame ascended a foot and a half from the superfices of the earth. The basis of it was of the compass of a man's hat about the brims. I then caused a bucketful of water to be poured on the fire, by which it was perfectly quenched, as well as my companions' laughter was stopped, who began to thiuk the water did not burn.

"I did not perceive the flame to be discolored like that of sulphurous bodies nor to have any manifest scent with it. The fumes, when they burst out of the earth and pressed against my hand, were not to my best remembrance at all hot."

In 1727 a work—"Vegetable Statics"—was published by Dr. Stepheu Hales, in which he describes experiments made by him in the distillation of coal. From 158 grains he obtained 180 cubic inches of inflammable air.

In 1733 Sir James Lowtherland laid pipes from his coal mine in England and burned the escaping gases on the surface of the earth.

Iu the Philosophical Transactious, 1744 (Vol. 41, fol. 59), an experiment concerning the spirit of coal by Johu Clayton is thus recorded, 85 years after Thomas Shirley's experiments:

"Having seen a ditch withiu two miles from Wigau, in Lancashire, wherein the water would seemingly burn like braudy, the flame of which was so fierce that several strangers have boiled eggs over it, the people thereabouts indeed affirm that about thirty years ago it would have boiled a piece of beef aud that, whereas much rain formerly made it burn fiercer, now after rain it would scarcely burn at all.

"It was after a long-continued season of rain that I came to see the place and make some experiments, and found accordingly that with a lighted paper, though it were waved all over the ditch, the water would not take fire. I then hired a person to make a dam in the ditch and fling out the water, in order to try whether the steam which arose from the ditch would theu take fire, but found it would not. I still, however, pursued my experiments and made him dig deeper, and when he had dug about the depth of half a yard he found a shelly coal; and the candle being then put down into the hole, the air catched fire and continued burning. I observed that there had formerly been coal pits in the same close of ground, and I then got some coal from one of the pits nearest thereunto which I then distilled in an open fire. At first there came only over phlegm, afterwards a black oil, and then likewise a spirit arose which I could in uo way condense, but it forced my lute or broke my glasses. Once when it had forced the lute, coming close thereto in order to try and repair it, I observed the spirit which issued out caught fire at the flame of the candle and continued burning with violence as it issued out in a stream, which I blew out and lighted again alternately for several times. I then had a mind to try if I could save any of this spirit in order to which I took a turbinated receiver, and putting a candle to the pipe of the receiver whilst the spirit arose, I observed that it catched flame and continued burning at the end of the pipe, though you could not discover what fed the flame. I then blew it out and lighted it again several times, after which I fixed a a bladder, squeezed and void of air, to the pipe of the receiver. The oil and phlegm descended into the receiver, but the spirit still ascending, blew up the bladder. I then filled a good many bladders therewith and might have filled an inconceivable number more, for the spirit continued to rise for several hours and filled the bladders almost as fast as a man could have blown them with his mouth, and yet the quantity of coals I used were inconsiderable. I kept this spirit in the bladders a considerable time and endeavored several ways to condense it, but in vain; and when I had a mind to divert strangers and friends, I have frequently taken one of these bladders and pricked a hole therein with a pin, and compressing gently the bladder near the flame of a candle till it once took fire, it would then continue flaming till all the spirit was compressed out of the bladder, which was more surprising because no one could discern any difference in the appearance between those bladders and those which were filled with common air; but then I found that this spirit must be kept in good, thick bladders, as those of an ox or the like, for if I filled calves' bladders therewith it would lose its inflammability in twenty-four hours, though the bladder became not relaxed at all."

(To be Continued.)

Mining Titles.

Does a mine owner lose title to his property by allowing tribute men or leasers to work in his mine? This is a serious question and must be considered by all mine owners who have allowed tribute work to be done in their mine. This question is propounded to our readers, says the Virginia *Enterprise*, after an interview had with H. W. Tangerman, superintendent of the West Consolidated Virginia Miniug Company. Through Mr. Tangerman we learned of a suit now pending in the District Court of Storey county, which suit is set for trial on the 29th day of August. This suit is startling in its nature, insomuch that the plaintiff, Edward Chandler, sues the West Consolidated Virginia Company to foreclose two liens for the sum of $1,057 for tribute work performed upon the ground of the company.

Mr. Tangerman's story is as follows: Last year, when times were very dull and men could not get work because of the fact that all the mines were discharging men, he obtained permission from the president of the company for himself and Mr. Treglown to enter on the croppings of the West Consolidated mine and to mine and extract ore therefrom, providing they could find any ore that would pay to mine and extract. We were to make no expense to the company, because the mine was shut down under an injunction suit held against it in the California courts. They (Mr. Tangerman and Mr. Treglown) began work on the croppings about September, 1893. After they had been working several months Treglown was taken sick and put a substitute in his place by the name of William Thomas, he being a late arrival from Carson, with the understanding that he (Treglown) would pay the board of his substitute, and when ore was found he (Treglown) would retain from its proceeds all moneys advanced in board bills and other supplies. In the month of December following the West Consolidated Virginia mine started up work, after being closed down by an injunction suit for three years. They appointed him (Mr. Tangerman) superintendent. About a month previous to this time he made an arrangemcut with Edward Chandler, plaintiff in the lien suits, that he (Mr. Chandler) should take his (Mr. Tangerman's) place in the tribute working on the croppings. The terms of agreement were that he (Tangerman) should pay Chandler's board and lodging, and when ore was found he (Chandler) was to receive $1 per day after all other expenses incurred by working in the croppings had been paid. They (Chandler and Thomas) did not succeed in finding ore in paying quantities. Now Chandler and Treglown's substitute, William Thomas, have brought a suit against the West Consolidated Company, which was in no way interested in the tribute work, but had extended a favor to Tangerman and Treglown in time of need.

Mineral Land Rulings.

Hoke Smith, Secretary of the Interior, has issued the following circular of instructions to the local land officers:

In the matter of the selection, by railroad companies, of lands in satisfaction of their grants, the following rules and regulations will be observed in determining whether the lands selected are mineral or non-mineral lands.

1. Where the lands have been returned by the Surveyor-General as mineral, a hearing may be had to determine the character of the land, under Rules 110 and 111 of Rules and Regulations issued Dec. 10, 1891, controlling the disposal of mining claims.

2. Where the lands selected by the company are within a mineral belt, or proximate to any mining claim, the railroad company will be required to file with the local land officers an affidavit, by the land agent of the company, which affidavit shall be attached to said list when returned, setting forth in substance that he has caused the lands to be carefully examined by the agents and employers of the company, as to their mineral or agricultural character, and that, to the best of his knowledge and belief, none of the lands returned in said list are miueral lands.

Upon receipt of said list you will cause it to be examined and a clear list to be prepared of all lands embraced therein that are not within the radius of six miles from any mineral entry, claim, or location, which list shall be transmitted to the Department for its approval. If any of the lauds embraced in said list of selectious are fouud upon examination to be within a radius of six miles from any mining entry, or location, you will cause a supplemental list of such lands to be prepared and return the same to the Register and Receiver of the district in which they are situated, and notify the railroad company that they have been returned. The Register and Receiver will at once cause notice to be published iu such newspaper as shall be designated by the Commissioner of the General Land Office containing a statement that the railroad company has applied for a patent for the lands, designating the same by townships, and has filed list of the same in the local land office; that said lists are open to the public for inspection; that a copy of the same, by descriptive subdivisions, has been conspicuously posted in said land office for inspection by persons interested, and the public generally; and that the local land officers will receive protests, or contests, within the next sixty days, for any of said tracts, or subdivisions of land claimed to be more valuable for mineral than for agricultural purposes.

At the expiratiou of said sixty days, the Register and Receiver will return to the Commissioner of the General Land Office said supplemental list, noting thereon any protests, or contests, or suggestions as to the mineral character of any of such lands, together with any information they may have been received as to the mineral character of any of the lands mentioned in said list. After the same shall have been returned by the Register and Receiver, you will first eliminate from said supplemental list all the lands that have been protested, or contested, or claimed to be more valuable for mineral than for agricultural purposes, or concerning which any suggestion has been made as to their mineral character. The remaining lands you will certify to this Department for approval and patenting as agricultural.

In regard to lands protested, or contested, or claimed to be mineral, or concerning which any suggestion has been made, or report by the Register and Receiver as to their mineral character, you will order a hearing to be had by the local land officers in each case. After giving due notice to the persons furnishing such information, and to the railroad company, under the existiug rules and regulations of the Department concerning hearings in cases where the land has been returned as mineral land.

The railroad company shall pay to the Register and Receiver the cost of advertising said lands in the manner set forth.

You are further instructed that all lists which have been heretofore prepared in accordance with and rules, regulations or instructions of the Secretary of the Interior, where such rules have been complied with (such as furnishing affidavit showing the nonmineral character of the lands in accordance with instructions of the Interior Department), and such mineral affidavits furnished for each subdivision of forty acres shall be excepted from the terms of the foregoing instructions. Also, where lists of selections are now pending of lands returned by the Surveyor-General as mineral, where hearings have been had in accordance with rules 110 and 111 of Rules and Regulations of Dec. 10, 1891, above referred to, and the local officers have determined that said lands are now mineral in character, and such determinatiou has been approved by the General Land Office. Such land shall be submitted to the Department for approval without further investigation although they may be within six miles of any mineral claim or location, unless since said hearing mineral claim or locations have been made of any tract embraced in said list, in which event you will eliminate said tract embraced in said list, and hold the same for further investigation.

A Legal Dispute.

The case of the Cassel Gold Extracting Co., vs. the Cyanide Gold Recovery Co., is on trial in London, England. The plaintiffs claim that the defendants infringed on their rights in the ownership of the MacArthur-Forrest patent by employing a process of obtaining gold and silver from ores, consisting in dissolving them out by treating the powdered ore or compound with a solution containing cyanogen, or a cyanide, or a cyanogen-yielding substance, substantially as described and claimed in the specification and ask the usual relief in a patent action. The defense in general is a claim that the MacArthur-Forrest invention or discovery was not subject matter for a patent and that the process was largely a matter of public knowledge.

The plantiff's counsel in opening the case said that since the issuance of the patent in 1887 between 600,000 and 700,000 ounces of gold had been successfully extracted by the process, principally in South Africa, having a value of $12,500,000 in money, and royalties had been paid to the extent of £117,000 in connection with the process. The first claim, he said, was for the use of cyanogen in the way described, and the second for a particular proportion of the cyanogen in the dilute solution. He said there was no dispute as to what the defendants had done; the sole dispute was as to the deduction from those facts. The defendants had erected an experimental laboratory. They advertised for persons to come and have their ores tested by the Pielsticker process, Pielsticker being a gentleman who had purported to invent the infringing process. The defendants permitted his clients to inspect what was being done at the laboratory of Mr. Harland. The suggestion was that they were not working to obtain gold by the dissolving action of the cyanide of potassium, but by electrical action, which had the effect of extracting the gold from the ore electrically, and not by the process Messrs. Forrest and MacArthur had described. The plaintiffs' case would be that electricity did not add anything to the dissolving power of the cyanide of potassium; in other words, that the gold which was extracted was in the defendants' process got out by the dissolving action of the dilute solution in exactly the same way as in the plaintiffs' patent.

Several witnesses for the plaintiff gave testimony: Jas. Dewar, Roberts-Austen, Lord Kelvin, E. J. Mills, Robert Tatlock, Geo. Gore, Sir Henry Roscoe, Louis Janin, Prof. Crookes. John Stewart MacArthur, F. I. C., one of the patentees, said that in 1886 he began the chain of experiments which led up to this patent. Before he experimented he had no kuowledge that the cyanide of potassium could be practically used to extract gold from ore. Persons would not, he believed, have been led to that by the alleged anticipations. There was no known practical means of extracting the gold from tailings which were, comparatively speaking, poor in gold. At that time the residual gold was going to waste. By their method ore containing 3 dwts. of gold, or one part in 200,000, could be profitably worked. Witness then detailed the various experiments made before the taking out of the patent. Until his experiments he had no knowledge that cyanide of potassium would dissolve the gold in ore. He agreed with the other scientific witnesses that it was the fact that a dilute solution had a selective action, having verified that fact in the course of his experiments. He understood Rae's process to be a simultaneous dissolving and depositing process. It was within his knowledge that Rae's patent was unworkable, and, in his opinion, nobody would have been led to the dissolving of gold by cyauide of potassium by Rae without the use of electricity. Taken to Pielsticker's process, witness said that he went to Mr. Harland's place of business and saw the defendant's apparatus. He had experimented to see whether the electric current had any effect in dissolving the gold in the ore, and found no beneficial effect. His results showed that the dissolution of the gold out of the ore was not assisted by the electricity. On some ores his process would operate better than on others, but it was applicable to all ores. The conclusion that the electricity had no effect was arrived at from the fact that there was as much gold left when electricity was not used as when it was.

For the defense Claude Vatin, R. H. Harland, G. Riley and James McTier appeared. The latter said that in 1887 the fact that the cyanide of potassium would dissolve gold and silver was well known. There was no invention in the application of that knowledge to gold ore. Witness was present at the experiments of the defendants, the results of which, he said, were that the gold was dissolved more rapidly when electricity was used. Rae's process would be effective for getting gold into solution, but it was impossible that it could be a financial success because of the difficulty of getting the gold out of solution. Cyanide of potassium had been reduced in price from 17s. per ℔. to 1s. per ℔. Faraday disclosed as much as any of the extracts relied upon in the particulars of objection, but in chemical literature there were more specific references to the solubility of gold in cyanide of potassium than those which the defendants relied upon. In 1885 the price of the cyanide of potassium he would use for this process would have been 2s. 6d. per pound. He considered that the electrical pressure and current with which Lord Kelvin worked was too small to produce any electrical result. In 1887,the process of getting the gold out of cyanide by zinc was not practicable—that was to say, only some of it could be got out. Witness had never tried the Pielsticker process.

Gold-Mining Concessions in Mexico.

The following has been sent officially, with a request for publication:

The Executive is hereby empowered, during the period of one year dated from the promulgation of this law, to make contracts for the prosecuting and operating of gold mines and placers, in accordance with legislation now in force, and subject to the following conditions amendatory to said legislation:

First. The contracts shall be in the form of concessions, which the Executive shall issue freely, and upon the hypothesis that it is in possession of data sufficient to justify the belief that such concession is to cover the mining of gold in the district to be developed.

Second. For the purpose of this decreo, gold-mining regions shall include deposits of that metal, whether alluvial or not, as well as deposits whercin the gold is found mixed with some other metal, but where the commercial value of the gold exceeds that of the other concomitant metals.

Third. No region shall be considered as gold-hearing if the average show of metals in all tbe mines included therein yields less of gold than expressed in the foregoing paragraph.

Fourth. As soon as the nature of the ore changes in such manner that the average yield mentioned in the foregoing paragraph is not realized, the contracts granted under this law shall be revoked.

Fifth. Each contract shall clearly specify the limits of the tract to be developed.

Sixth. Within the limits of such tract, the concessionaires can designate and acquire as many claims as can he located upon unoccupied territory, or incorporate therein claims belonging to the concessionaires prior to the date of the contract, as well as any others they may hereafter acquire by purchase or other legal manner.

Seventh. Concessionaires shall obtain prospecting permits, subject to the laws in force, all other companies or private individuals being inhibited from prospecting in that district for any kind of metals, but with the proviso that such permits shall be good for six months and no longer, and that, once lapsing and during the two years immediately succeeding, neither the concessionaires nor any other party can obtain such exceptional prospecting permits.

Eighth. The concessionaires can import into the Repuhlic, free of import duties, the machinery, instruments, tools and necessary apparatus for the purpose of prospecting and development of materials of construction for mines and metallurgical offices, provided such concessionaires first advise in each case with the Department of the Treasury, and abide hy the regulations therehy imposed. Should the concessionaires sell a portion of all the supplies thus imported, without the consent of the Government, they shall lose all such supplies thus sold and forfeit also all the franchises granted in the concession, unless such sale he rendered necessary hy hankruptcy or liquidation.

Ninth. The concessionaires shall enjoy a rebate on the annual mining tax for a period up to ten years, paying in the first year at the rate of one-tenth of the impost in force, and an increasing amount each year until the full tax becomes payahle in the eleventh year.

Tenth. During ten years time the concessionaires shall be exempt from all federal impost, with the exception of the tax alluded to in the foregoing article, and with the exception of taxes payahle in stamps and mintage and assay taxes or dues.

Eleventh. The concessionaires shall invest in their undertaking during the first three years a capital of $500,000 at least, to he increased to $1,000,000 during the following five years.

Twelfth. The concessionaires shall, within the time and the terms designated in the contract, present the plans, samples, ores, descriptive reports and geological specimens resultant upon their prospects.

Thirteenth. The concessionaires shall allow an inspector, appointed and salaried hy the Executive, to examine the work of prospecting and mining.

Fourteenth. The concessionaires shall guarantee compliance with their obligations by a deposit, in minimum, of $10,000 in bonds of the public debt, to he furnished at the time of signing of the contract, which they cannot redeem until they have proven the inversion of capital (see Article II) of at least $200,000. If the honds deposited bear interest, the depositors shall withdraw the coupons in due time for collection.

Fifteenth. The exemption from imposts mentioned in the ninth and tenth articles do not include the mining of alluvial gold. In such case, the concessionaires, if discoverers thereof, shall pay, during the mining of such alluvial gold, at the rate of one-third of the imposts in force.

Sixteenth. Within two years from the date of this contract the concessionaires sball establish a metallurgical establishment, capahle of treating at least 400 tons of ore per week, or, in place of such establishment, any other concern capahle, in the judgment of the Secretary of Publie Works, of such amount of work.

New Specimens Received.

The specimens added to the collection of the State Mining Bureau since June 23d, the date of last notice, are eighty in number, among which may be mentioned as of special interest the following:

Copper ore, chalcopyrite of good quality, from a new discovery at Eden valley, Mendocino county, Cal.; W. P. Thomas.

Twenty-six specimens of various crystallized minerals; J. Z. Davis.

Gold quartz from a numher of mines in San Diego and Riverside counties.

Ullmannite and other rich nickel and cohalt ores from Nevada; J. A. Yerrington.

Rich ore, silver and gold, from the 3250-foot level of the Savage mine, Virginia City, Nevada, the deepest workings on the Comstock lode which yielded ore; J. A. Yerrington.

Splendid specimen of stalactitc limonite from Shasta county, Cal.; Chas. Camden.

Very fine crystallized cinnahar from the Silver Bow mine, Napa county, Cal.; M. G. Rhodes.

A very curious compound fossil tooth from Kernville; Benj. T. Price.

Gold quartz from Riverside, Tulare, Fresno and Madera counties.

Several specimens from the Diadem mine, Plumas county, and vicinity; J. A. Edman.

Rich silver ore and chalcostihite, Butte and Boston mine; Montana; from the company.

And many others.

Not Going but Coming.

A correspondent of the Sonoma *Democrat* makes the following truthful remarks about mining:

As a rule you can tell by a man's conversation what branch of mining he follows—when a man talks about dips, spurs and angles you know he is a quartz miner; when his whole discourse is about the pitch of the bedrock, old channel and "an ounce to the pan" you can bet on him as a 49er and would not give a nickle for the best quartz ledge in the State. But as I have been in other camps I will talk about all kinds of mining perhaps. I have heard it remarked frequently when in the cow countries that the mines were played out and the future of California was entirely in her agricultural resources—a greater mistake was never made. Mining of all kinds is ouly in its infancy here. There are thousands of miles in length, if struug out in a straight line, of quartz ledges that, with the application of electricity and a large plant of 60 to 100 stamps, will yield large returns for ages to eome; and the rivers of California, with a fall of many thousand feet between the summit of the Sierra Nevada and the sea level, will produce enough power to run a million stamps so long as water runs down hill, and now power by electrieity ean be transmitted 100 miles successfully. Mining is the coming industry of California, but must be carried on by strong men, both mentally and finaneially. The days of the "grass root" miner have goue by, I am sorry to say. Then there are the ancient river channels where for many conseeutive miles no man has seen the bottom; that kind of mining will boom once more. There is gold by the ton in these old river beds, but no poor man dare attempt to open them up; the sun has set on the poor mau's day. The time was wheu four good determiued youug men could stake out a tunnel elaim and not have a dollar and go to the nearest "grub store" and be a perfect stranger to the merchant, tell him where they were going to prospect aud ask for, and get, all the credit they wanted for tools, powder and grub, commenee work and work away for weeks and even years, running for the channel. "Honest Miner" was the word. He cooked his own grub and patched his own overalls with the flour sacks branded Self Risiug. Yes, those were the days of old, but the demand for gold will be so great that men of wealth will hunt up the old timers and euquire how deep this or that shaft or enclosure was when the water run them out forty years ago, how and why a certain gulch paid so big, and if you can find a pioneer without a theory you can find a "white raven." Electricity generated by the rivers of the State must do the work and when that day does eome the mountaius will be like a hive of bees in May; but before that can take place Congress must make the provisiou or reservation of mineral from all agricultural patents, availablc for miners, and then look out for a boom in miuing.

Gravel or placer mining has not shared equally in the mining boom with quartz for several reasons. Men who are uot exclusively miners, and some of them in Santa Rosa, have put their money into tunnel claims and commenced work and followed it up with commendable energy, but they started wrong, and perhaps employed incompetent men to direct the work, consequently disappointment has followed in nearly every case. They have located or commeneed the tunnel by *guess* not knowing where the extreme bottom of the old river bed was; some of them are too low perhaps, and have run entirely nuder the channel, others too high and find to their sorrow that they can't drain the water by many feet and have abaudoned the enterprise and quit in disgust, and eurse the miner when the fault is all their own. The base of the Table Mountain furnishes hundreds of just such examples to my personal knowledge, but the gold is there to delight the eye and cheer the heart of the meu who will combine skill, money and energy in the near future.

The State's Oldest Miner.

The Colfax *Sentinel* makes the claim that Placer county has among her residents the oldest miner in California, in the person of Fred Howell Sr., at the Hidden Treasure mine at the Sunny South, Placer county. He has followed the business of mining since he was six years old. He is now sixty-five years of age, and the period during which he has been a practical miner is a trifle over fifty-nine years.

Mr. Howell is a native of Wales aud eommenced his active work as a gatekeeper in a eoal mine in his native land. At the age of tweuty-five he came to Placer county (in '54) and has followed gold mining with varying success ever since. For the past eleven years Mr. Howell has been a shareholder in the Hidden Treasure mine, and for the past five years he has superintended the sluice washing and the clean-up. Miners of a riper age who are still in California are numerous, but we believe this veteran miner can justly claim the distinetiou of having spent more years in active mining than any other person in the Goldeu State.

Scientific Progress.

Force of Gravity.

Prof. Mendenhall, of the United States Coast and Geodetic Survey, has under way a series of experiments to determine the force of gravity at different points throughout the country. As is well known, the force of gravity varies at different places at the earth's surface. At the equator it is less than at the poles; on a mountain it is less than at the sea level. The force of gravity is required to be measured for several purposes. A knowledge of its force at a good many points throws valuable light on the exact form of the earth. Then, again, certain experiments made at one place cannot be utilized at some other place, unless the force of gravity at the two places be known. For instance, the weight of a given volume of air as weighed at Paris or at Munich, cannot be compared with its weight at San Francisco till the force of gravity is known at the three places.

The method of making the experiment is to compare the time of swing of a pendulum with the time of swing of the same pendulum in a place where the force of gravity is known. This is a matter easy to understand as to purpose, and very complicated and difficult to accomplish accurately. One pendulum might be injured in travel, so three are carried and used at each place. The varying weight of the air affects the time of swing, so they are swung in a vacuum. Varying temperature affects the length of the pendulum, so the temperature has to be carefully measured. No clock or chronometer can be trusted, so time has to be determined by observation of the stars. Each of the three pendulums is swung with first one and then the other side to the front, and for eight hours in each position, and the number of swings in each position for each pendulum is determined, though it is not necessary actually to count them. So forty-eight hours, provided that cloudy nights do not interfere with the observations for time, may suffice for one determination.

The party have made one determination at Deer Park, Md., at an altitude of 2700 feet. They will make a determination at Chicago, and then two in the Yellowstone National Park. One will be in the heart of the volcanic region of the park, and one near the Grand canyon of the Yellowstone. There may well be some anomaly there, owing to the nature of the underlying rocks; if so, other adjacent stations will be occupied, so as to get some insight into the nature or extent or causes of the anomaly. Other determinations are then to be made at Salt Lake City, at Green River valley, at Grand River Junction, at Gunnison, at Denver, at Colorado Springs, at Pike's Peak, and, if time allows, at two or three locations on this coast.

Uses of Photography in Business.

Amateur photography is with most people purely a diversion, the means producing diversion or else recording diverting experiences. Whether one takes pictures or souvenirs of pretty places not soon to be revisited, or of occasions not likely to be repeated, or whether he makes lantern-slides for parlor entertainments, the prime idea of the artist is usually his own or some one else's pleasure, and is quite dissociated from his regular business. It has long been apparent, however, that the art of photography is one of such great practical use in all lines of industry that every wide-awake and progressive man ought to acquire it, just as he would acquire skill with a typewriting machine, or even with a pen. The newspaper writer is thus enabled to illustrate his report of novel inventions, strange scenes and awful catastrophes. The lawyer thus procures indubitable testimony. The civil engineer's assistant goes out and thus procures for his chief a faithful description of a broken bridge or burst dam. And so on. These uses are rapidly multiplying, and the application of the camera thereto is steadily becoming more frequent.

In the *American Machinist* there is mentioned a good instance of this kind. At the Builders' Iron Foundry, in Providence, while a large steel casting was being drilled, the drill broke. The machinist attributed this mishap to a blowhole in the casting. Of course, on general principles, the foundrymen evinced skepticism, but the metal was split open and a photograph taken. This revealed a serious defect in the casting. The picture was sent to the foundry, and the argument closed. In the same establishment every difficult piece of work is photographed at each stage of progress, so that if a similar order has to be executed later, and especially if new foremen are employed in the shops, it will be possible to recall details perfectly.

The New Method of Photographing in Colors.

Considerable attention is being paid in Paris to the new method originated by a member of the National Academy of France for photographing in colors, the process being pronounced, from a scientific point of view, the most interesting ever invented in this line. Briefly, the operator lays upon a sheet of glass a very delicate, translucent film of chloride of silver, and against this film is placed a vessel containing mercury, so that the latter is in contact with the film. Thus arranged, the glass sheet and mercury are placed in the camera like an ordinary sensitive plate, and, exposures being made, the image of the object to be photographed is projected upon the glass, the light conveying the image passes through the glass, on through the translucent film, and is reflected back by the mercury behind. The action of the light splits the silver in the film into thin layers, which breaks up the light rays into their component colors. As the play of colors in an opal is due to that gem being composed of layers of quartz superposed one upon another—these layers breaking up the light into different hues—a similar result follows the placing of the layers of silver in the film, which, through the operation of a curious law, reproduces the tints of the object photographed.

Gold Leaf.—Specific Gravity.

At the last gathering of the Royal Society of England J. W. Swan showed some specimens of gold leaf prepared by him, which are only .000004 inch thick. They are made by electroplating with gold on some of the wonderfully thin sheets of copper that Mr. Swan produced in a similar manner some years ago. After the gold had been deposited the copper foil was dissolved away by perchloride of iron, leaving only the gold. The gold leaf so prepared has a thickness of from one-fifth to one-tenth that of the thinnest films that can be produced by the old fashioned process of beating.

Prof. C. V. Boys showed photographs of the apparatus used by him to determine the average specific gravity of the earth, the apparatus itself being too delicate to be brought to the hall for exhibition. His method is substantially the same as that used by Cavendish, a century ago, except that the present apparatus is far more delicate and accurate. Professor Boys has been working on this problem for five years, and he finds that the specific gravity of the earth, taken as a whole, is 5.527. It is believed that this result is correct to within one-fiftieth of one per cent.

With a Mergenthaler Linotype machine, which casts a whole line of type from molten metal in response to the operator's manipulation of keys resembling those of a type-writing machine, it is now possible to measure a man's work without taking a printed impression on paper of the matter thus set. William C. Harding, of the *Boston Herald* composing-room, has invented an automatic register which keeps tally of the number of lines, and hence of the "ems" turned out.

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Mechanical Progress.

A New Rust and Scale Preventive.

Nearly every man in charge of a large steam boiler, in either a steamship or a stationary plant, is visited every week or two by somebody who has a new remedy for scale and rust which he wants to sell, or at least to have tried. It would be unjust, perhaps, to declare that none of these have much merit, but it is safe to say that not one has yet been generally accepted as a satisfactory means of attaining the desired end. Hence the field is still open to inventors. Charles Law, of Pittston, Penn., may have a first mortgage on it, though, for he has just patented an idea looking to that end, and it has been received with favor by some of those who have tried it.

The principle of Mr. Law's invention is electrolysis. In an ordinary zinc and copper battery the sulphate is analyzed by electric action, the acid going to one pole and the metal to the other. By placing a lot of zinc inside his iron or steel shell, Mr. Law provides for a similar operation, though it goes on more slowly. The oxygen and hydrogen of the water are dissociated, the latter escaping in the form of gas and the former combining with one of the metals. In making such combination, however, the oxygen must go to the zinc, the positive element in such a couple. But if the oxygen is prohibited from combining with the iron or steel, then the latter cannot rust, for rusting is nothing but oxidization. Mr. Law claims no novelty up to this point. The hanging of zinc plates in steamship boilers is an old story; but by pulverizing that metal and inclosing it in a perforated cannister or cartridge, he gets a greater superficial area within a much smaller compass; and by adding to the zinc another substance, which serves as a "quickener," he says that he promotes electrolytic action in cold water as well as warm. What the quickener is, though, he does not care to say. This inventor, who, by the way, has for years been so connected with mining operations as to be familiar with the peculiarly destructive effects of water in mines upon boilers there, further claims that if one can keep the iron or steel of the boiler from rusting, the incrustation of that metal with lime (if there be any in the water) will also be prevented, and the lime will be precipitated in loose particles. He has made special experiments which lead him to that conclusion.

The Cunard Line is said to have experimented with Mr. Law's system on the Campania, and to have gotten better results therewith than with zinc plates. The cartridges for this test weighed about fifty pounds.

WHILE people are inventing, asks a writer in the New York *Critic*, I wonder why they don't invent something to make typewriting machines noiseless. I have been racking my brain to think of something, but all my suggestions are set aside with scorn. When sewing machines were first invented they were as noisy as a fire engine under full head, but now they are as noiseless as a cable car when the gong is not ringing. I have great faith in Yankee ingenuity, and believe that the noiseless typewriting machine is only a question of time, and not a very long time, either.

A NEW TROLLEY WHEEL has been introduced which has provision for lubricating with oil, in additiou to the graphite bushing. The hub is furrowed out on the inside, aud felt packing is tucked into the recess. The felt is kept saturated with oil, which also permeates the graphite and so reaches the spindle.

THERE is a demaud in the rural districts for a telephoue that can be attached to and worked with a barbed fence wire from men who are obliged to go about on their ranches inspecting fences for breaks. They sometimes wish to report and call for materials for repairing damage when twenty or thirty miles from headquarters. They are now compelled to ride back in person. A salesman of electrical apparatus says that if a good telephone was put in much time and trouble would be saved. "The staples holding the two top wires to the posts could be removed, insulators put in their places, and a man would have a complete metallic telephone circuit around his ranch.

Made a Discovery and Lost It.

A Chicago electrician found an art only to lose it. For a long time he had been experimenting with wires for incandescent electric lamps. In the ordinary incandescent lamp the vacuum is not perfect, the wire burns away and the film of soot forms on the inside of the glass. The electrician hoped to make a wire which would have more "resistance" and last much longer; hence, to his joy, he succeeded. He made one lot of wires which, being placed in the vacuum lamps, lasted five times as long as those that were and are now in general use.

The discovery meant a fortune. He made arrangements to manufacture the lamps on a large scale, but when he made another lot after the same process it was a failure and would not serve the purpose. He tried again and again, but to this day has never been able to duplicate the successful ones. There might have been some accidental ingredieut, some little difference in the method of manufacture, that made this one lot a great success. The electrician is not disheartened. He is working away, attempting to rediscover his discovery.

A BOSTON man has patented a steam bicycle. The boiler is placed between the wheels and is only a few inches thick. The steam cylinder on one side is connected by a rod and crank with the forward wheel, while the steering is done by the rear wheel. The rider sits above the boiler, which he straddles, and steers with one hand, while he works the throttle with the other. The appearance he would present iu case of a boiler explosion would be an anatomical curiosity.

THE last census report gives $36 per horse power per year of 313 days at ten hours per day as the average cost of steam power in the United States. This is equal to 1.15 cents per horse power per hour. It is reported that power is being contracted for at Niagara at from $8 to $24 per horse power per year of 365 days, counting twenty-four hours to the day, no additional charge being made for nights or Sundays, as the waterfall "goes on forever."

WHAT is called the Kinetic motor for street cars has been tried lately in Chicago. It is really a steam engine, but at the start the boiler is filled with superheated water and the furnace is supplied with red-hot anthracite coals, so that the preliminaries of lighting a fire and getting up steam are dispensed with. The apparatus is said to require little attention, and one charge will last for about twenty miles of service.

SENATOR COCKRELL'S bill to promote aerial navigation authorizes the appropriation of $100,000 for payment to any iuventor in any part of the world who shall, at any time prior to the first of January, 1900, construct a vessel that will demonstrate the safety of navigatiug the air at a speed of thirty miles au hour, aud capable of carrying passengers aud freight to the extent of five tons.

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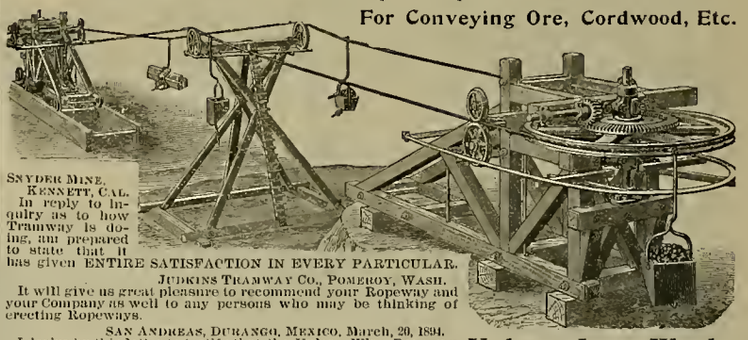

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SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

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ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

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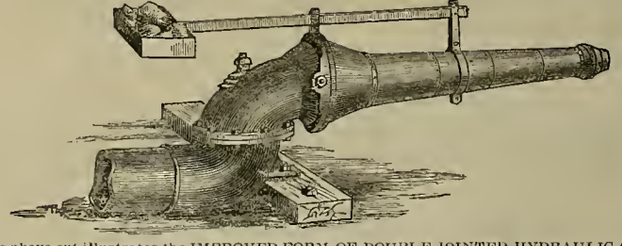

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

A MINING SUIT.—*Ledger:* A mining suit of great importance, and involving questions of mining law which will make it extremely interesting to mining people generally, is about to be commenced in Amador county. The case involves the question of trespass on the part of the Kennedy Mining and Milling Company on the ground of the Argonaut Mining Company, which lies south of and adjoining the Kennedy mine. The Argonaut people claim that the Kennedy Company has stoped out the Argonaut ground in many of their levels, taking out a large quantity of rich quartz, and will sue for an amount of money that will take several ciphers at the right of a large figure to express. The papers in the case on the part of the plaintiff will probably be filed in a few days.

The stockholders of the Bay State Mining and Development Company held their annual meeting at Plymouth on the 4th inst., and the following officers were elected: Wash Marion, president; W. A. Jones, vice-president; W. A. Jones, W. T. Jones, T. B. Slevin, D. E. Hayes, G. W. Easton, directors; W. T. Jones, superintendent; F. E. Luty, secretary; A. J. Coster, assistant secretary. The reports of the superintendent for the past year show the affairs of the company to be in a flourishing condition, with prospects for a grand future. It is the intention of the company to at once erect a ten-stamp mill of the latest pattern. By consent of over two-thirds of the stockholders, the office and principal place of business will be removed to San Francisco.

All negotiations between the Haywards-Lane mining combination and the Gover people are off. Haywards telegraphed to his representatives in Amador county a few days ago, saying that if the agreement was not signed by all the attaching creditors by a certain date he would withdraw his proposition. The agreement was not signed and the negotiations were withdrawn.

FAVORABLE OUTLOOK.—*Record:* The mining outlook for Sutter Creek is bright. New developments are being made. The Wildman and the South Eureka mines are improving in appearance with each succeeding day. It is expected that the Mahoney mine will be put in working order in connection with the adjoining property—the Wildman. The Mahoney has on it a forty-stamp mill and is well equipped for immediate work.

The Kennedy never varies—except to improve—in pouring out its usual monthly output. The Keystone at Amador moves along in its usual way, and with its big monthly payroll adds largely to prosperity of that section. Alvinza Hayward and his partners have taken hold of the Gover mine. The Mayflower group of mines, under the superintendency of Dr. Emmons, is gradually getting in shape for effective work. The company have now from thirty to fifty men on its payroll.

Mono.

MONO'S "EGYPTIAN" PORPHYRY. — The Bridgeport *Chronicle-Union* says Mono county has within its confines that which are more valuable than gold mines—an immense quarry of "Travertine," and a mountain of "Egyptian porphyry." The former is located within one-half mile of Bridgeport, and the latter within striking distance. The travertine is the only known deposit outside of Italy, and the porphyry outside of Egypt. The former has been sold by W. E. Lindsey to San Francisco parties, some of whom are interested in the latter with Mr. Lindsey, who located the porphyry discovery last week.

ANOTHER DISCOVERY.—Bridgeport *Chronicle-Union:* W. E. Lindsey arrived from Carson on Thursday and departed yesterday morning to make a location of another important and most valuable discovery in Mono county, within a few miles of Bridgeport. The discovery is the only one known outside of Egypt, and is immensely valuable, it being what is known as Egyptian porphyry.

Nevada.

A BORING MACHINE.—*Transcript:* A portable engine weighing 7200 pounds, and consigned to the Derbec Mining Company, left this city this morning drawn by Grissell's big six-horse team. The engine is mounted on wheels and is provided with a seat for the driver of the team. It will be used to run a boring machine.

The Derbec Company intend to prospect, by means of this boring machine, the old Watt ground and the Dc Noon ground. It is believed that there is rich gravel there, and if the prospects confirm this belief the company will probably purchase these properties and proceed to develop them on an extensive scale.

Boring machines have never been used in this county, but they have been employed with good results in prospecting gravel channels in Placer and other counties. The success of the experiments soon to be made by the Derbec people may induce other companies to adopt the boring process in prospecting their ground.

Plumas.

FROM LONDON. — *National Bulletin:* On Tuesday, J. W. Moyle, superintendent of the Slate Creek Gravel Co., arrived from Sierra City, accompanied by A. Morley Fletcher, who is direct from London and comes to look after mining in Plumas and Sierra counties. Mr. Fletcher is a director of the company which owns the Bonanza mine near Sierra City, also of the Slate Creek Gravel Co., whose property embraces three and one-fourth miles of the bed of Slate creek between Gibsonville and La Porte. This creek bed is filled to the depth of over twenty feet with rich deposits from the great gravel mines of that section operated since 1850. In these deposits are lodged millions of gold. It certainly ought to be one of the best mining propositions in the State.

San Joaquin.

COPPEROPOLIS TO THE FRONT.—Stockton *Record:* If, as stated, the copper mines of Michigan have been exhausted, it will direct users of the metal to the mines of Copperopolis, that have as yet taken out but a very small fraction of the ore in that locality. Until recently the process of reducing the ore has been very expensive, but by use of a lately discovered electrical process the cost has been materially decreased. The Michigan mines have always been the greatest bar to the success of their California competitor, and now that they are a thing of the past, Copperopolis can be expected to appear as she did in the palmy days of yore, and night and day shifts of hundreds of men will once more populate the pretty little mountain city that has existed of late years from the simple reason that it could neither get away from itself or anybody else.

Shasta.

THE BALAKLAVA MINE. — *Free Press:* S. Weil has succeeded in interesting capital in this mine, and was up there to ship 15 tons of ore to Selby for a milling test. The ore was sent to Copley on mules from whence it was shipped by rail. The ore will go about half and half in gold and silver, and the gold will pay the cost of production. As soon as things get in shape, the railroad company will be induced to put in a switch at the mouth of Squaw creek, from which point a good road will be constructed to the mine.

Sierra.

SIERRA COUNTY MINES.—*Transcript:* J. O. Jones, superintendent of the North Fork Mining Company, which was recently incorporated for the purpose of mining in Sierra county, intends to start work on the company's gravel claim, west of Forest City. The Wisconsin adjoins it on the south. Previous to twelve years ago the mine was profitably worked for a number of years, and just before operations were suspended $40,000 was taken out from quartz stringers found in the claim. The rock was rich. The old workings have caved in and it will be necessary to run a new tunnel, which will probably be started from Lucky Dog ravine, a mile west of Forest City, and near the road. The tunnel will have to be run about 3000 feet to reach the channel; and, although it is a big undertaking, the company will rush the work forward as rapidly as possible. As soon as the channel is reached and breasting begins, a big force of miners will be put to work. The company owns between 600 and 700 acres, which takes in about a mile and a half of the channel.

The Ruby gravel mine is looking well, and thirty-five men are employed. They are working alongside the old Bald Mountain ground on the south. There is lots of new ground on the north that has never been worked. The company has been operating there fifteen or twenty years.

About thirty-five men are working in the Bald Mountain Extension. Since the present workings, near the old Pliocene mine, were reached about a year and a half ago, the mine has been paying.

GENERAL NOTES.—*Messenger:* Horace Tahor has his tunnel in the Gibsonville ridge some 2600 feet, and the face in the hardest kind of rock. He has an upraise from the face of the main tunnel up about fifty feet, which is also in very hard rock. His operations are watched with interest by the whole northern part of Sierra and southern Plumas, because his success means the resumption of life throughout both counties.

At the Thistle shaft over seventy men are employed. If this company had a tunnel into their ground instead of having to work through a shaft, they would have the biggest mine on the Pacific coast. They own about nine miles of the Gibsonville ridge, and all their ground is known to be rich.

Through bad management the gravel elevators, put in by Phil Doray's company, on Slate creek, are not a success. If the elevators were let alone they would be all right, but the ones in charge kept changing this and then that until the whole thing was a failure.

THE EMPIRE MINE.—Supt. Buckley tells the *Transcript* that the company intends putting up heavy machinery capable of working to any depth desired, and that when everything is completed they will have one of the best plants in that section. Machinery has been ordered and will soon be hauled to the mine, and all work will be crowded ahead with dispatch.

Maltman & Thompson will build reduction works for the company, and will attend to the working of the sulphurets.

The Empire has been worked for a number of years, on a small scale and with varied success, and it is the opinion of practical miners and experts that the property is valuable and will give good returns if operated on a more extensive plan. There is a large ledge of good quartz in the shaft. The mine is located in Gold valley, about eight miles above Downieville.

Upward of 100 tons of freight will he hauled to the mine within the next few weeks, and it is thought that before many months roll by there will he at least 100 men employed there.

The machinery is to be run by electricity, which will be generated hy water power obtained some distance away. This will he the cheapest and best method of operating the machinery.

Siskiyou.

MINING NOTES.—*Journal:* Austin & Co., of the Greenhorn blue gravel mine, are sinking a new shaft nearer the pay gravel and affording more fresh air in the drift channels, as the old shaft is about 360 feet from the present operations.

Fernandez & Co. had another cleanup after two months' run on Cherry creek last week, and brought to town 640 ounces of gold, as the result, which will he the last until winter comes again, owing to the water supply giving out. This is the second cleanup this season, the owners having realized over $10,000 on a former run. The claim is at the big reservoir just over the Deadwood mountain summit from Yreka, about seven miles distant, and will pay still better in future years, by reason of getting opened in better shape for securing the rich bedrock gravel in the old deep channels of the creek.

The Benz Bar and Fort Jones claims, at Klamath river, are almost in readiness for the work of washing to be commenced, and it is expected both claims will yield rich returns this season, although their opening is nearly two months later than usual, owing to the high stage of the river and the great amount of labor required in wing-damming. It costs big money, a vast amount of timber and lumber, as well as hard work, to turn the water off from the pay channel this season, by reason of the extra quantity of snow on the mountains and the cool weather keeping it from melting rapidly until after the 1st of July.

Thos. Rodgers, a Portuguese miner, cleaned up $6300 from the past spring and summer work at his claim on Canal gulch near Hawkinsville, within three miles of Yreka, and then sold his claim for $6000. He left for Portugal yesterday.

C. H. Jordan, lessee of the Adams quartz mine on Cherry creek, has been taking out some very rich quartz lately, which yields about $100 to the ton.

Cal Hughes returned from the Hungry creek mines, Siskiyou county, last Wednesday, says the Klamath Falls *Star*, with glittering specimens of quartz from the Tuscarora ledge. It is red ore, free-milling quartz, and has assayed $436 to the ton. The ledge runs from one to three feet wide, with its hanging-wall side of quartzite, granite on the footwall, and yellow porphyry on both walls. It is a very promising mine. The shaft is on the saddle of the hill, thirty-five feet deep, sloping southeast and northwest, the tunnel starting in on the northwest side 250 feet from the shaft, which it taps at a depth of 100 feet. The tunnel is now in 176 feet, leaving 74 feet from the shaft.

Trinity.

CHANGED HANDS. — Weaverville *Journal:* Beaudry & Co. have taken charge of the old Diener mining property at Minersville and will put about 25 men at work next Monday to build a wagon road from the town of Minersville to the mine.

NEVADA.

Washoe County.

BORAX WORKS.—*Journal:* The Reno Borax Company Works are now in successful operation. The marsh is situated in the extreme northwestern part of the county, near the California line. The works were started a few days ago by inexperienced men before the arrival of B. F. Gray, who has charge of the works. The result of the first day's work under unfavorable conditions was 900 pounds of crystallized borax, worth about 7½ cents per pound.

The result is very satisfactory to the company. The marsh is extensive and the industry promises to he profitable.

Nev Co

REOPENING THE MERRIFIELD—*Herald:* The Champion Company is developing the Merrifield on a large scale and may yet have a second Champion there.

It is practically a new mine for Nevada City. The old Merrifield Company worked the Deer creek end of their ground to a depth of 1000 feet and then quit. The mine lay idle, with improvements going to decay, for a number of years. It was finally purchased hy the Champion Mining Company, whose ground it adjoined, and when the Champion was shut up hy litigation the company turned their attention to the Merrifield. Last spring they started an incline shaft on the property, and now they have completed the necessary surface improvements.

The incline is a two compartment of easy grade, with pump shaft, and is now down 250 feet. At 200 feet the first level was made and drifting commenced. About 100 tons of quartz have already been taken out, and a five-foot ledge in the bottom of the shaft is supplying more. The drift is running into new ground never touched by the Merrifield Company.

The surface improvements are all good and substantial. The hoisting works is almost as large as the Champion's and the dump is high enough for all purposes. A large ore hin has been built, capable of holding 200 tons, and from this a track is being laid to the Champion mill. On the creek side of the hoist is a splendid site for a mill, if another should be needed. The building is lighted hy electricity.

About 25 men are employed and they are making good headway. The mill will be started soon.

OREGON.

Baker County.

MINING NOTES.—*Democrat:* The Rock Creek Mining Company, N. A. McMillan superintendent, is just now seriously considering the introduction of a chlorination plant in addition to a new mill. The mill used the past few months hy the company was owned hy the Robinson Mining Company and fell into the hands of Mr. P. Basche, who sold it, and it is to he taken away from its present site. This prevented its use hy the Rock Creek Company, and the Beckwith mine is now without a reduction plant.

Speaking of chlorination, it seems now to be well settled that this process is just the one to work the ores of this county, and why its introduction has not been made long ago at the Beckwith, Rohhins-Elkhorn and Baisley-Elkhorn cannot well be explained unless it be that in the cases of the Rohhins and Baisley mines the superintendents were not sufficiently acquainted with the merits of the process. The time is sure to come when chlorination will be in vogue generally in the sulphuret camps, and then some of the moss-back mine superintendents will wonder why they did not adopt it long before.

The owners of the Pyx mine now find themselves in full possession of about $17,000 worth of new and valuable improvements on their property—the result of the expiration of the bond on the mine held by J. G. Chapman and others. The mine is now in first-class shape for working.

H. Holcomb is equipping his mine near the Virtue with a reduction plant, and it is learned that the mine is making a splendid showing of ore.

Alexander Baring is still in London, England, in the interest of a reorganization of the North Pole Mining Company operating at Cracker creek. Development work on the North Pole mine continues, and several good ore veins have been cut in the long tunnel, upon which work has been in progress for the past year.

NORTH POWDER MINES.—*Democrat:* On the Baker side of the Powder river, about four miles east of the North Powder, M. Gutrie has bonded a ledge of free milling gold ore for $10,000, with $1000 down as a bonus. The mine is known as the Arizona, and the bonding was done by a Chicago firm. A ten-stamp mill is to be erected on the property at once, and, according to the specifications of the contract, Gutrie is to receive fifty per cent of the proceeds during the first six months. The terms of the contract are sufficient to give an idea of the probable value of the ore. Pittsburg, a claim alongside of the Arizona, is owned by a Salt Lake company.

THE ROBBINS-ELKHORN.—Supt. J. H. Robbins, of the Robbins-Elkhorn mine at Elkhorn mountain, brought to Baker City with him a gold bullion output amounting to $2000, the result of a twenty days' run. He is making large shipments of concentrates to Denver and Everett, Washington.

EUREKA AND EXCELSIOR.—*Democrat:* The Eureka & Excelsior mines at Cracker Creek, owned hy the Eureka & Excelsior Consolidated Mining Company, principal stockholders in which are St. Louis, Mo., people, have been leased by John Longmaid, of Salt Lake City.

COLORADO.

CLEAR CREEK COUNTY.—Silver Plume *Standard:* Mining in this county keeps up far beyond the expectations of a little over a year ago, when the price of silver dropped away down. At that time it hardly seemed possible that much would be done beyond working out what ore happened to be in sight, but as time rolled on and people became accustomed to changed conditions, they recovered from the panicky feeling and set about doing the best they could under the circumstances, with the result that the production of the mines is being kept up fairly well, and new enterprises are being planned and carried out in the way of developing old and new properties that shows that the industry is far from being killed, as it was feared that it would be. Of course there is nothing like the activity that there would he if silver commanded a better price, and the miner frequently gets but little or nothing for his toil; but, on the whole, there is enough money taken out to keep people alive and business going on. There are indications that the output will be increased rather than diminished hy the prospecting that is going on in many places.

Leadville District.

MEANING OF SILVER ACTIVITY. — *Herald-Democrat:* A prominent mining man who is largely interested in the silver mining industry was asked to explain the cause for a revival of interest in silver mining as indicated by the inauguration of various new enterprises. He gave the following explanation: Last summer there was great uncertainty with reference to the mining industry. The price of silver was low enough, but what made the situation much worse was the fact that the market lacked firmness and stability. In other words, the miner could not tell what the price of silver would he from one day to the next, the fluctuation being so violent and uncertain. Under these conditions mining naturally languished. No one cared to engage in any enterprises so long as the danger existed that silver might drop to 50, or even 40 cents. The fluctuation of the market was utterly beyond calculation, hence mining men preferred to adopt a waiting policy until such time as silver should reach its normal level. After the repeal of the Sherman law there were several vibrations of the pendulum of price, then gradually the figure settled at about 62 cents. Mining men were then reasonably certain that the price would remain at this figure. This was none too good, but it was better than the former uncertainty. With the assurance that silver would remain at 62 cents, leading mining men felt that they could, without pecuniary loss, engage in a certain amount of development work in territory known to he mineralized. This accounts largely for the various enterprises which have recently been inaugurated near the city, and which would scarcely have been undertaken last year with the silver market in a state of violent perturbation. They are satisfied that silver has reached its bedrock price and will go no lower, and that whatever influences are brought to hear will tend to enhance its value.

IDAHO.

SUMMIT FLAT.—*World:* Eight or ten men are at work sinking an incline in the Mammoth mine, on Summit Flat. The sawmill is cutting timhers, and it is believed that work will continue without cessation hereafter. The mine, although rich and large, had lain idle for a good many years. J. J. Taylor, formerly of Ketchum, is the superintendent.

THE SOUTH AFRICA.—The further west the drift is run from the bottom of the South Africa shaft the richer is the ore obtained.

That coming out will yield over $100 per ton. The east drift is in fifteen feet, where ore has been reached. The mill resumed crushing yesterday.

WILL TRY IT. Two of Lembi county's properties have long lain idle, viz., the Sandy Creek group of mines with its mill near Fort Lembi, and the mill and mines of the Pino Creek group near Shoup. Both properties are owned by the Lembi Mining and Milling Company, a corporation. The manager for the company, Mr. J. M. Parfet, has in the past few years used every legitimate effort to persuade the directors to operate at their own venture, but without avail. Failing in this, he has, in company with a few select miners, secured a lease and bond on the mines, and they expect to demonstrate to the company that their faith in the properties is well founded.

Tom Ball of Pocatello expects to achieve remarkable results with his gold saving machine, which he has been working on the Snake river. Three men in three days cleaned up $63, moving about thirty tons of dirt a day. Mr. Ball is making arrangements to purchase a dredge with a capacity of 1000 tons a day, to operate in connection with his machine.

MONTANA.

LIXIVATION WORKS STARTED UP. — *New Northwest:* President Paul A. Fuzz of the Bi-Metallic Company arrived in Philipsburg from St. Louis a few days ago, and last Saturday gave orders for the starting of the new lixiviation plant which has been in course of erection the past several months. The plant is put in for the purpose of working over the accumulated tailings from the amalgamation process. It has twelve ore vats of twenty-two feet diameter and ten feet depth, which will hold 151 tons each. Its capacity is 300 tons per day. Fires were lighted in the furnaces Saturday and everything in connection with the plant is now running in good shape. There is an accumulation of tailings sufficient to keep the works running steadily for eighteen months. This move on the part of the company is a godsend to Philipsburg, which probably has suffered to a greater extent than any other camp in the State from the slump in silver. In addition to the large number of men necessary to the operation of the works, a considerable number are employed in the big drain tunnel between the mine and mill, and the work is being driven rapidly, though it is not possible that it can be completed before May of next year.

NEW MEXICO.

DRY PLACERS.—Hon. Amado Chaves informs the Santa Fe *Republican* that during a recent trip to Dolores on official business he found about 160 men working there in the placers and making from $3 to $8 per day with dry washers. Those people are mostly Mexicans from the ranches of the Rio Grande valley, who have been practically ruined by the depreciation in the price of wool, and who have gone to Dolores to make money to support their families. Don Amado brought home a double handful of the dirt after it had gone through the dry washers and panned twenty-six good sized colors out of it, showing that while these people are making good wages they are saving only the very coarsest gold. In 1845, before the American occupation, there were more than 3000 people working in these placers, as the extensive workings still show. After the change of flag they scattered and most of them went to Chihuahua.

One of the wonders of these fields is that to-day an American has a hole on top of a hill 200 feet high and is washing out $10 a day from the boulders and dirt. Mr. Chaves also tells of a man named Anastacio Sandoval, who many years ago found a nugget in these placers worth $1600.

SOUTH DAKOTA.

RAINY LAKE REGION.—*Pioneer:* Jeff Hildreth says that the five-stamp mill at the Little American mine, of which he is manager, which is in the immediate vicinity of Rainy Lake City, has been crushing twenty tons of ore a day since it began running on July 19th. After running from the 19th to the 21st the mill was stopped, and for the two days' run twenty-eight ounces of free gold were cleaned up. Then the mill was started again and ran until the morning of Aug. 1st, cleaning up for this run of eleven days ninety-three ounces of free gold. The lower average of the last eleven days' run was due to the fact that surface ore was being worked, and ore taken from a branch of the vein which contains more than an average quantity of slate. The gold as it comes from the mill is not free from impurity, and its value is from $17 to $18 an ounce. At $17, the value of thirteen days' product of free gold from this mine is $2057, or at the rate of $128.23 per day. Aside from the free gold he has saved at least half a ton per day of concentrates, which have assayed from $250 per ton and upward. He says that the value of these concentrates, after deducting all expense of extracting the gold, is at least $200 per ton, assuming that they average only $250 per ton of gold. This would add $100 per day to the product of the mill and bring the total to over $250 per day. The expense of mining the quartz and operating the mill does not exceed $60 per day. The manager adds that he has thousands of tons of ore "in sight," and has every reason to believe that the mine will yield hundreds of thousands.

UTAH.

THE UINTAH COUNTRY.—A letter written at Fort Duchesne says:

"The mining excitement is high here. Parties are pushing in from Denver, Cheyenne, the Henry mountains and Colorado river region. The camp at Dead Man's, the center of attraction, and forty miles west of north from Fort Duchesne, is about as tough a place as they make them. Bad men and worse men from Creede, Denver, Cheyenne and Helena are there.

"They have ore which, it is said, runs from $280 to $1500 in gold. Cass Hite tells me that he is camped twenty-one miles northwest of our place. He has located some quartz claims there, but is not bothering with placers yet. His belief is that the field is a rich one. Last night he showed me a piece of rock in which I could see the gold with my naked eye. What he has is no fake, and it came from the head of the stream which washes down our gulch. I will ship you the samples we have the first opportunity. A party of Deaverites are here on their way to a point west of Dead Man's.

"I have seen a magnificent stretch of country right in the mountains and east of Lake Fork, about thirty to forty square miles in area. It is watered by a single mountain stream and four or five like streams. The soil is the richest I ever saw in Utah, and the grass and wild grain for twenty-five miles grow as high as a horse's back. People in Salt Lake have no idea of what a country this is. The mountain range and bad lands shut off the best country from ordinary travel, and unless a person travels by the Indian trails, as we did, he will not see the fine places.

"Traveling expenses are high in this region. Oats are $2 a hundred and hay $1.50 per bale."

THE BUTLER & BECK.—The Butler & Beck Mining Company owns a group of eight claims, which are developed by means of a 900-foot tunnel. Three hundred feet of stoping ground is ready for the stopers to go to work on, and enough ore can soon be taken out to run a mill for a long time. The vein averages four feet in width, half of which is pay ore, running about twenty-five ounces silver and $16 in gold per ton. The ore is free milling in character.

WYOMING.

OWEN'S MINING BOOM.—Owen correspondence Laramie *Republican:* The mining interests in these diggings are working up to what might be termed a paying basis. A few test runs have been made in the last few days, which show up well for the mine-owners. The test made on the Gold Bug shows that the gravel goes $2.40 per yard on the surface. Reports from the black sand, which is abundantly found in the gravel, show $40 per ton.

There is now a new machine on the Gold Bug, which will make a test of the ground and also of the quality of the black sand. There is also in course of construction a water wheel, which, when completed, will hoist 1750 gallons of water per minute. The wheel is what is known as the Mertz and Dodge patent.

ALASKA.

IMPROVEMENTS AT TREADWELL.—*News:* The improvements at the Treadwell works are completed. The gallows frame is eighty feet high, 18x46 in dimensions and arranged so that two skips will raise loaded cars from the shaft and dump them automatically into the crushers, capable of handling from thirty to sixty tons per hour each in the crusher-house built alongside the hoist plant, thirty-two feet from the ground. An ore bin, with a capacity of 200 tons, receives the ore from the crushers and discharges it through four chutes into cars, which are hauled to the mill bin by a locomotive. As soon as the hoist plant is completed, a three-compartment shaft will be sunk several hundred feet, and levels driven on the ore body to open the lower workings. Bricklayers are building a large brick smokestack at the chlorination works, seventy-two feet high; base, fourteen feet across; top, six and one-half feet; flue, 4½x4½. The walls are four feet thick at the base and one foot thick at the top. The stack will take 120,000 brick, shipped from San Francisco.

AUSTRALIA.

VERY WONDERFUL.—The following is a dispatch from London regarding recent alleged discoveries of gold in Western Australia: A party of six were returning from an unsuccessful prospecting tour to Coolgardie, on May 8th. When in camp one night, they separated to test and examine the neighborhood. A man named Mills came to one of the large "blows" which are characteristic of the country. He was astonished on rubbing his hands across the protruding piece of stone to see gold standing out prominently. He knocked a large piece off the boulder, and at his feet lay a magnificent specimen, literally studded with coarse gold, while before him, dazzling his eyes, was a magnificent reef of almost pure gold—a fortune in itself.

Mills, taking several pieces from the reef, placed them in his bosom, and carefully covering the reef with earth, found his mates. The next morning twenty-five acres were pegged off, and the adjoining blocks at each end were also taken up. One man went to town and bought a dolly—the largest he could procure. In one day they dollied 1000 ounces, and in a short time they had nearly $100,000 worth of ore. On June 23d they packed it in a cart and landed the treasure at the Union Bank. The manager weighed the gold, and it turned the scales at 4280 ounces. A few days after this the discovery became public.

One lump has been taken from the reef containing more gold than ore. It weighed 240 pounds and is worth $20,000. Of course, there is immense excitement in the region, and many other discoveries are reported, but there is unlikely to be anything left for late comers.

BRITISH COLUMBIA.

NAKUSP.—A movement is on foot to establish a mint.

The Nakusp Mining Company are working five men on their ground on Carihoo creek.

Work has commenced on the Nakusp & Slocan railway at Nakusp.

Over 1200 tons of ore will be shipped from Silverton, commencing next week.

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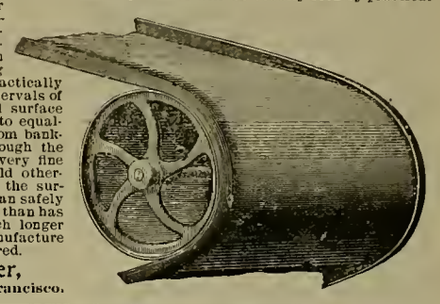

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Electrical Progress.

Electricity in Mining.

Many progressive men hold that of all the forces at command in the science of mining, electricity seems to be most adaptable and more nearly fulfills most of the conditions demanded, viz.: safety, efficiency, reliability, simplicity and flexibility on the one hand; on the other, the economic necessity of a minimum of cost in application and production. Risks to life and property are very great in mining and dictates both of humanity and economy will be best subserved by the adoption of any agent which will tend to minimize these risks. The great ease of production and application in the first instance, then its great flexibility and efficiency give electricity a strong claim to consideration.

Considering the demands of a mining plant, we see power consumed in winding, outside and inside hauliug, drilling, pumping, ventilation, lighting, signaling and explosive firing. Regarding the prime source of energy for such power it may be either hydraulic or steam power. In either case electricity comes to the front. In many cases the topographical surroundings and the location of fuel and water, limit the location of a steam plant, which may have to be so far away as to be very inefficient, where the steam is to be used at the mines; with electricity we generate it at these same boilers, and placing them where they will suit the economic conditions of best service, convey the power to its work with but slight loss. These conditions very often obtain, the location of a steam plant perhaps being a matter of great mechanical difficulty in transportation and erection in the first place, and where the site of water for the boilers and the haulage of costly fuel prescribe the limits. With this agent, though, we erect our steam plant and dynamos at the most advantageous site and take the electric cable to the mines, elevation and distance no longer almost insuperable obstacles. An instance of this kind is the plant at the Virginius mine in Colorado, at the elevation of 12,000 feet. The cost of fuel there, which had to be packed up the mountain on burros, was stated to be $18 per ton, amounting in a year to some $80,000. The present source of power is Red Cauyon creek, four miles distant from the openiugs, where 300-horse power is generated and carried to the mines at a pressure of 800 volts; the saving of fuel in one year alone paid for the electric plant.

When not at work, no power is consumed in electrical apparatus, the prime generator producing just what is consumed, antomatically. At a Michigan miue, 175-horse power are trausmitted three miles hy compressed air, with an efficieucy at the mines of only 35 per cent—thus showing a 65 per cent loss in transmission. With electricity, these figures would probably be reversed. One electric compauy guaranteed an efficiency of 73 per cent, based upon au initial efficiency of 100 and successive losses of 10 per cent in dynamo conversion, 10 per cent in line trausmission, and 10 per cent in reconversion at the motor. An ordinary efficiency of compressed air is from 20 to 40 per cent, rarely 50. The cost of conductors for carrying an equal amount of power at average pressures has been stated by Prof. M. C. Ihlseng in the case of electricity steam and compressed air to be as 1 to 27 to 19.

An invaluable feature of an electrical miniug plant is its great flexibility and the great ease with which changes in the distribution of energy cau be made. It is but a few hours job to branch and take a wire to any part of the mine to a motor. With greatest ease we lead a wire around a corner, take it up or down a shaft or slope. Simplicity and completeness commend themselves at all times to the miner and nothing can be more complete than the different ways in which we can haruess electricity to various uses in this directiou.

The impediments in the way of the adoption of this agent in mining have been several. Mr. Pocock says: "Electrical engineers are not familiar with the routine of practical mine workings and are, therefore placed at a disadvantage by not knowing the actual requirements of mining eugineers and the many little difficulties to be met with in undergrouud workings; aud until mining engineers have acquired the necessary knowledge and a confidence in electricity, it is only natural that they will continue to follow the beaten path. Experimeuts in mining are costly, necessarily, and until a method or appliance can hope to complete with the older way, it has to be brought to a "hard pan" basis before it will receive the consideration due to its merits, however prononnced or enticing. While an electrical mining plant as a whole is comparatively simple, yet the details of the mechanism of the different machines, locomotives, etc., remain to be considerably simplified to withstand the inevitable hard usage to which they will be snbjected."

Electricity and the Israelites.

There is nothiug new on the face of the earth, and there is no doubt that electricity was known to the Israelites, and probably to the Phœnicians. The first record of electrical phenomena is as old as the Ten Commandments. Moses, when he received the stone tablets on which the Ten Commandments were written the second time, built a box out of fir, not the common cedar or any other native wood, which had to be imported by Phœnician merchants from the southern part of Europe. Was this choice accidental, on accouut of the great value of the resinous wood, or was it the choice of the best known non-conductor among the great varieties of timbers?

Moses had the fir box lined inside and outside with beaten gold, which converted the ark of the covenant into a very expeusive but very perfect Leyden jar or storage battery for electricity. As gold is by 50 per cent a better conductor of electricity than copper, was the choice of gold again ou account of its value, or was it an inspiration or revelation? So much is certain, that if Edison or Tesla had lived in those days they could not have improved on the choice of material, aud the result was a powerful Leyden jar.

How was this Leyden jar charged? was the next problem. A fire of material rich in carbon was kept burning on top of the ark of the covenant, aud during day time a tall column of smoke guided the twelve tribes of Israel throngh there wanderings, and at night a tall flame was equally as well seen by them. Now carbon is a good conductor of electricity, and the particles of carbon floating in the smoke would conduct sufficient electricity to highly charge the Leyden jar. At least the current of electricity would be amply strong, so that if a hand were held toward the ark of the covenant sparks would result. That this was done hy Moses at different times is a matter of record, and that he could always depend that his faithful Levites would obey his instructions to the letter, and have the jar always charged.

After Moses' death Aaron, his brother, took the matter in hand and greatly improved the electrical power of the strange battery. He had the ark of the covenant placed in the temple, he had it surrounded by poles 50 ells high, or 150 feet. These poles were covered with beaten gold and gold chains were hung from poles to the ark of the covenant which made a very expensive but very complete and powerful electrical connection. In a conntry where electrical storms are as frequent and as powerful as in Palestine at an elevation of 600 feet and a reach of 150 feet of the best conductor, an abundant supply of Frankliu's electricity would necessarily always be on hand.

It is very likely that Aaron kuew nothing of amperes, ohms or volts, otherwise his two sons never would have monkeyed with this powerful apparatus, and they would not have been killed by fire breaking out of the ark of the coveuant and killing them without any wounds or burns appearing on their body.

Any coroner's jury of to-day, if it were to sit on an inquest over the body of Aaron's sons, would at once bring a verdict of death by a discharge of electricity.

Aaron knew this power, aud to make it effective, all he had to do to deal death from this apparatus was to remove the costly camel's hair carpets, which are almost perfect non-conductors of electricity, aud make the culprit stand on terra firma; death would result instantly by fire breaking out and leave no wounds or burns to account for his death. That several members of revolting tribes of Israelites were thus electrocuted is also a matter of record in the Bible.

Solomon in building his temple advanced one step further; he found that copper would do as well as gold. He had the temple covered with copper, and copper waterpipes led into the cisterns inside the temple. On the temple, or rather on its roof, a number of gilt spears were placed in vertical positions, ostensibly to scare off the birds, and to keep them from defiling the temple, but these spears were several cords high, or from 16 to 24 feet. Such a height would hardly he necessary for scarecrows, but it was ample to load the roof, waterpipes, etc., with a powerful current of electricity.

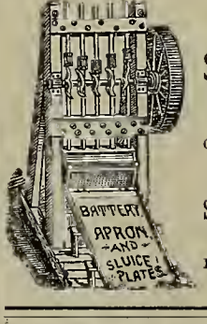
Franklin, the electric chair in the State of New York, as well as the discovery of the Leyden jar itself in Leyden, Germany, are all back numbers. History repeats itself, whether recorded or not.—Savannah Morning News.

Substitue for the Trolley.

In order to take off the current from an overhead wire for an electric car the latter is usually equipped with a grooved metallic wheel, which is pressed upward against the wire by springs actuating a pole rising from the top of the car. At curves aud crossings this device, the "trolley" that gives its uame to the whole system, sometimes becomes displaced, aud some time is required to get it into positiou again. Meantime the car is at a standstill, perhaps blocking the way of other cars, and at night losing its lights also, if it happens to depend on electricity for illumination. Hence the need of some improvemeut ou the plan now extensively pursued in this country. Recently has been introduced, as a substitute for the trolley wheel, an oblong metal frame, supported in substantially the same manner. Two such frames are placed on each car, probably to "make assurance doubly sure." This arrangement is free to slide from side to side at curves, yet will continue to maiutain an electrical connectiou. In this respect the invention is douhtless a success; though it would seem the frame would get entangled in the cross-wires which support the overhead wires.

The "Loud" Speaking Telephone.

A loud speakiug telephone was recently described in the English electrical papers, for which the claim was made that it would "revolutionize our present system of working," as the message over it was spoken with such force as to be heard all over a large room. Another firm now lays claim to the discovery and prior operation of the "loud speaker." There is a certain trick in the use of excessive battery, usually a storage battery, in connection with a low resistance, granulated carbon transmitter, which may possibly account for both of these "discoveries." Any good long distance transmitter can be made to speak out so that it can be heard all over the room by the use of this subterfuge. A very loud effect cau be secured by the use of what is known as a telephone repeater, which has the same relation to the telephone as the relay has to the telegraph sounder. The repeater has so far not been commercial, for the reason that no successful circuit has yet been inveuted which would enable it to work more than one way. A most important invention, if it ever does appear, will be a telephone repeater which will work both ways over au ordinary metallic circuit. In cases where the transmitter is forced hy the use of excessive battery, which is sometimes doue for the benefit—or otherwise—of prospective subscribers of stock, while the results in loud speaking are astounding, such forcing is injurious to the transmitter and shortens its life, in fact it is frequently burned up by the heavy current which it is called upon to sustain. The public may be interested to know that in more than oue public exhibition of loud speaking telephones the transmitters at the other end of the line have been so forced by strong storage batteries as to make it necessary to employ half a dozen or so transmitters. The strain of the current was so severe that the trausmitters became too hot to use, and one was kept in operation while the other five were cooling off. This is one of the tricks of the trade which is not without significance in the preseut "loud-speaking" contention.



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Practical Information.

A Vast Army.

About $1,400,000,000 went into the treasuries of the 1890 railroad corporations in the United States during the year which ended June 30, 1893, most of it being derived from carrying 503,560,612 passengers 14,229,101,084 miles and 745,119,482 tons of freight 92,588,111,833 miles on 176,461 miles of railroad.

The statistics of the Interstate Commerce Commission, just issued at Washington, are interesting when they tell of the legions of men whose existence depends on the prosperity of the vast adjuncts to commerce and civilization.

These 1890 railroad companies were the mainstay of 873,662 employes of all grades, so that one person in every 90 of the population depends for a livelihood on a railroad company. To equip the "plant," without which not one employe could earn a day's pay, the capitalists invested $10,500,000,000 and received $100,929,855 in dividends, less than one per cent, although the gross earnings were $1,220,751,874. The operating expenses were $827,921,299, so that, on a rough calculation, out of every dollar received by the companies 75 cents went into the pockets of employes.

To carry all these passeugers and move the freight required 34,788 locomotives, of which 8957 were for passenger trains and 4802 for switching. The road engines drew 31,384 passenger cars and 1,047,577 freight cars.

This transportation service gave a living to nearly 400,000 men. The superintending, clerical work and other avocations of the higher employes gave incomes to 35,384 persons; 256,212 were employed on the ways and structures, and 175,464 mechanics and others were paid to look after the rolling stock and other equipment.

It is worthy of note that the armies of men employed incidentally in industries which are germane to railroading and on which such service depends are not factors in these statisties.

Interesting data are found on analyzing these figures. For instance, it is found that each locomotive on the passenger service drew in the year, on the average, 66,268 passengers and traveled 1,588,601 passenger miles. Each freight locomotive drew in the year 40,062 tons 5,031,889 ton miles.

The number of passenger cars to each milliou passengers was 53, and the number of freight cars to every million tons of freight was 1613. The average journey of each passeuger was nearly 24 miles, aud the average haul per ton was a little more than 125 miles. Passenger train mileage was 335,618,770 aud freight train mileage was 508,719,506. The passenger service brought in 29.49 per cent of the income and the freight service 68.23 per cent. Each 100 miles of railroad in the United States was the source whence 515 men obtained money to live.

If second tracks, yard tracks and sidings are taken into consideration there are more than 230,137 miles of lines in the country, of which 10,051 miles are second track. The increase of milcage in 1892–93 was nearly 4900 miles, an increase over 1891–92 of 1900 miles. The greatest increase was in the State of Washington, 556.32 miles; in Montana, 409.66; in Minnesota, 406.69 miles and in West Virginia, 365 miles.

Forty-two companies in the United States have a mileage of over 1000 miles and 26 have a mileage of between 600 and 1000. Companies having a mileage of 250 or less number 902. The 42 big companies controlled 98,385.54 miles of line, leaving 1848 companies controlling but 44.22 of the total active railroad mileage.

The accident statistics show 2727 employes killed, 31,729 injured, and 299 passengers killed, 3229 injured. One employe was killed to every 320 men employed, and one was injured while 27 escaped. Trainmen fared the worst, as ten per cent of them were injured in various ways. As to passengers one out of nearly 2,000,000 was killed, and one out of 183,822 injured, or one killed for each 47,588,966 passeuger miles run, and one injured for each 4,406,659 passenger miles run.

Makes Himself Generally Useful.

Si Warman thus describes the work of a fireman on a New York Central fast passenger train: At least every thirty seconds he throws open the furnace door, and without a false motion or the slightest delay hurls exactly three shovelfuls of coal on the fire. He knows just how to spill and spread it with a dexterous turn of the wrist. Before Albany is reached he must throw 6375 pounds of that coal into the fire, or nearly 40 pounds a minute, or an average of 44 pounds a mile. Then, too, he must know exactly where he is along the road, and when to drop his shovel and seize the bell-cord. He must know the proper iustant to vault into his seat when important curves are reached to watch for signals. He must see that the steam doesn't vary, and he is proud to shout in your ear when near Albany: "She hasn't varied three pounds since we left New York." He must watch the water gauge of the boiler and is constantly kept changing the pumps and seeiug that they do their work properly. All the time he must keep throwiug in his 44 pounds of coal on the fire every mile. It isu't long before he surprises you with another motion. He throws open the furnace and thrusts a long, double-pronged fork into the fire. With a twist he prods the glowing mass, and when he pulls his fork out its teeth are eherry red. Then comes the whir of the shovel again and the sound of the hammer as Tompkins breaks up the large lumps of coal. Wheu you approach Montrose, near Peekskill, the eugineer begins to slow down. If you look ahead you will see a uarrow trough between the rails filled with water. The engine is going to take on water at a flying leap. Tompkins stands at the side of the tender with his hands on a lever. Engineer Foyle suddenly startles you with a shrill whistle between his teeth that would put to shame the warning signal a New York newsboy gives to his gambling mates when a policeman comes in sight. Instantly the lever flies back, and as you look at the wheels of the teuder you see surging up among the trucks a torrent of water. It splashes and roars, and as you wonder if you wouldn't be carried away, two whistles from Foyle, sharper and shriller than the first, warn Tompkins to pull up the scoop and that the end of the water trough is near. Then Tompkins goes back to his coal, his pump, his pipe, water gauge, his bell, his watch for signals, aud you wonder what new work he will do next. Before you are aware of it, he touches you upon the knee and motions you to raise your feet while he turns on a hose aud wets the floor of the eab to keep down the dust, after which he sweeps up with a stubby broom. Next he is shaking the grates with a big steel lever that looks like the tiller of a large sail boat. You now begin to take in what it means to be a fireman. Toward the end of the trip you taphis shoulder and shout to him: "This seems to keep you pretty busy." "I tell you there is uo funny business about this work," is his response.

THE *Engineering Magazine* says that the flesh side of leather is the best to place against the pulley when such leather is used as a belt, notwithstanding this to be contrary to the most usual practice; but this general practice is due to the ideas of belt-makers rather than to those of belt users. Traction, he says, is greater where the surface is elastic and has a clinging tendency than where it is hard and smooth. This is because this kind of surface clutches the pulley more securely by being pressed into all the pores and interstices of the metal or varnish. If a smooth, hard belt were desirable, theu of course a thiu metal band would be the best thing.

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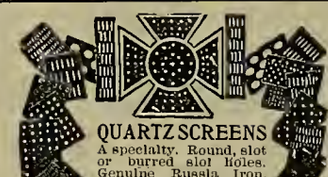
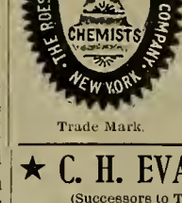

QUARTZ SCREENS
A specialty. Round, slot or burred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron, Zinc, Copper or Brass Screens for all purposes. CALIFORNIA PERFORATING SCREEN CO., 145 and 147 Beale St., S. F.

THE GOLD and SILVER EXTRACTION COMPANY, OF AMERICA.
LIMITED.
TRADE MARK.

MACARTHUR-FORREST PROCESS
MacArthur-Forrest Process.
CAPITAL, . . . £110,000 STERLING.
To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.
Advisory Board in the United States: Thomas W. Gead, Manager; Hugh Butler, Attorney; John F. Bell; P. George Gow.
OFFICE: MCPHEE BUILDING, DENVER, COLORADO.
Agency and Experimental Plant, Mechanical Arts Building, Midwinter Fair, San Francisco, Cal.

THE ROESSLER & HASSLACHER CHEMICAL CO.,
73 Pine Street, New York.


Trade Mark.
CYANIDE
—OF—
POTASSIUM,
Ferricyanide of Potassium,
Peroxide of Sodium,
Hyposulphite of Soda,
Sulphide of Iron,
And Other Chemicals.

★ C. H. EVANS & CO., ★
(Successors to THOMSON & EVANS.)
110 & 112 BEALE STREET, S. F.
MACHINE WORKS,
Steam Pumps. ✦ Steam Engines.
. . *All Kinds of MACHINERY.* . .

: : DEEP WELL : : PUMPS!

W. H. Birch & Co. (Incorporated)
Manufacturers of
Passenger and Freight Elevators,
Improved Steam Pumps,
Improved Corliss Engines,
Mining Machinery,
Cable Railway Machinery.
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(A CORPORATION.)
Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. Extra sizes and lengths made to order on short notice.
611 and 613 FRONT ST., San Francisco, Cal.

Rand Drill Co.

Rock Drilling, Air Compressing,
Mining and Quarrying
Machinery.
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BRANCH OFFICES:
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Apartado 830 . . . . . City of Mexico.

Adamantine Shoes and Dies
—AND—
CHROME CAST STEEL
Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.
Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.
H. D. MORRIS, Agent, 22 Fremont St., San Francisco.
Special attention given to the purchase of Mine and Mill Supplies.

Stamp Cam.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 16, 1894.

Silver shows a slight advance during the week. There is an increased demand for Mexican dollars. New York lead quotations continue $3.10, but it would he difficult to buy there at that price; $3.50 would be nearer the selling price. Now that the tariff hill has finally passed hoth houses, it is asserted the pri e of lead will he less a question of desire on the part of the trust.

The coal trade is dull; there is a full supply aud light demand. The new tariff hill reduces the duty from 75 to 40 cents per ton. If consumers can get the benefit the result will be locally satisfactory. Quicksilver continues quotable at $36. The July receipts were 1536 flasks; the receipts for the first seven months of '94, 15,293 flasks.

The total exports of tin plate from Great Britain to this country during the past five years are as follows, in tons of 2240 pounds: 1894, first seven months, 118,099; 1893, 255,583; 1892, 276,479; 1891, 325,145; 1890, 318.108.

The following is a Treasury statement of the average ad valorem rates of duty of the McKinley law and the new hill on a number of items. Wherever the duties are specific in either hill they are reduced to ad valorem rates for purposes of comparison:

	McKinley.	New hill.
White lead	50.12	29.60
Bicarbonate of soda	60.47	30.24
Manufactures of glass	60	35
Iron ore	42.70	22.72
Iron in pigs, etc	26 to 41	15 to 21
Chains	47.28	30
Nails	24 to 36	23 to 30
Wheels	83.72	41.86
Lead, sheets	46.65	18.33
Nickel	23.77	14.26
Zinc in sheets	29.19	14.59
Manufactures of metal	45	35
Scrap iron	45.83	28.47
Scrap steel	43	25.59
Bar iron	25 to 53	16 to 32
Bars of rolled iron	61.77	44.93
Boiler or its plate, iron or steel	54	25
Rails of steel	58.24	33.99
Sheets of iron or steel, common or black	27 to 70	20 to 55
Tin plates	78.44	42.42
Tin, manufactures of	55	45
Steel ingots, etc	29 to 50	20 to 40
Wire rods	24	22.68
Cast-iron vessels, etc	26.97	17.98
Coal, bituminous	22.72	22.12
Coke	20	15
Burrstone, manufactured	15	Free
Composition metal, copper	6.49	Free
Plates of copper, not rolled	11.80	Free

New York Prices.

NEW YORK, Aug. 16.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	28¾	62¾	....	....	....
Friday	28¾	62¾	9 00	3 10	19 00
Saturday	28¾	62¾	9 20	3 10	....
Monday	28⅞	62⅝	....	....	....
Tuesday	28⅝	62⅞	9 20	3 10	19 25
Wednesday	28⅞	63	....	....	....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, per cent per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt-edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by leuder	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers', 60 days	$4.88¼
London Merchants	$4.86¼
London Sight Bankers'	$4.89½
Refined Silver, per ounce	63
Mexican Dollars, nominal	51½@51¾

San Francisco Metal and Coal Market.

ANTIMONY.

Per lh	—	@	12

BORAX.

Refined, in car lots	—	@	7¾
Powdered, "	—	@	7¾
Concentrated, "	—	@	7¼

COPPER.

Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16

IRON.

Bar, base	—	@	2½
Norway, base	—	@	4½

PIG IRON. Spot.

Eglinton, per ton	23 50	@	— —
Glengarnock	22 50	@	— —
American Soft, No. 1	— —	@	— —
Shotts, No. 1	22 50	@	— —
Puget Sound	— —	@	— —
Clay Lane White	22 50	@	— —
Langloan	23 50	@	— —
Gartsherrie	22 50	@	— —
Barrow	23 50	@	— —
Cargofleet	— —	@	— —

LEAD.

Pig	—	@	4½
Bar	—	@	4¾
Sheet	—	@	5⅝
Pipe	—	@	4 87½

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10

QUICKSILVER.

Home trade, per flask	35 87½	@	36 00

STEEL.

English, lb	—	@	20
Canton tool	—	@	8½
Black Diamond tool	8½	@	15
Pick and hammer	6½	@	10
Machinery	4	@	5
Toe Calk	—	@	4¼

PIG TIN.

Spot, per lh	22	@	22½

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 50
Nanaimo	6 25
Gilman	5 75
Seattle	6 75
Coos Bay	5 50
Cannel	8 75
Egg, hard	12 00
Wallsend	7 00
Scotch Splint	8 00
Brymbo	7 25
West Hartley	8 25

TO LOAD—PER TON.

Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	15 00	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	8 25	@	— —

COKE.

English, to load	9 00	@	9 50
" spot, in hulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, August 16, 1894.

There was a general advance in prices during the week, and nearly all the listed stocks were in good demand. Work has been resumed in the Yellow Jacket, and is to he on the 1700 level of the Con. Cal. & Va. Low water in the Carson river has caused the Mexican mill to shut down. The California Mining Company had a cash halance of $69,237 on the 1st, after paying all July expenses.

The following illustrates the changes of the week:

MINES.	9	16
Utah	.....	$ 08
Sierra Nevada	68	71
Union	64	72
Mexican	1 15	1 35
Ophir	2 20	2 55
Consolidated California and Virginia	4 00	4 70
Best & Belcher	1 20	1 55
Gould & Curry	54	65
Savage	43	41
Hale & Norcross	74	70
Challar	35	31
Potosi	48	48
Bullion	17	17
Exchequer	.....	.....
Alpha	11	.....
Confidence	1 05	.....
Yellow Jacket	45	54
Crown Point	80	73
Belcher	.....	92
Overman	14	14
Justice	.....	20
Alta Consolidated	23	23
Consolidated New York	.....	.....
Challenge	40	.....
Bodie	1 10	1 70
Andes	.....	57

San Francisco Stock Board Sales.

SAN FRANCISCO, Aug. 16, 1894.

FIRST SESSION—9:30 A. M.

100	Alta	23	
200	Hale & Norcross	70	
100	Andes	57	
750		69	
300		56	
300	Justice	20	
200	Belcher	92	
600	Mexicau	1 35	
600	Best & Belcher	1 55	
200	Mono	38	
275		1 50	
550	Ophir	2 55	
50	Bodie	1 70	
100	Overman	14	
750		1 75	
650		13	
100	Bullion	17	
100	Potosi	48	
100	Bulwer	24	
50	Savage	41	
100	Caledonia	15	
150	Seg Belcher	13	
200	Chollar	31	
200	Sierra Nevada	74	
300	Crown Point	73	
200	Utah	08	
500	C. C. & Va	4 70	
100	Union	72	
300		4 65	
350		70	
100		4 60	
200	Yellow Jacket	54	
400	Gould & Curry	65	

SECOND SESSION—2:30 P. M.

100	Alta	24	
500	Mexican	1 25	
300	Andes	55	
400	Mono	35	
150	Belcher	89	
650	Ophir	2 40	
100	Bullion	16	
100	Overman	13	
400	Con Cal & Va	4 50	
125	Sierra Nevada	70	
400	G & C	60	
100	Yellow Jacket	50	
100	Hale & Norcross	70	

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 7, 1894.

524,128.—FURNACE—G. E. Belmor, S. F.

523,967.—BOTTLE STOPPER—M. L. Bergman, Spokane, Wash.

524,084.—NUTLOCK KEY—J. C. Brown, Santa Barbara, Cal.

524,243.—RAISING VESSELS—O. A. Bulette, Charleston, Wash.

524,163.—PACKING BOXES—J. V. Coleman, S. F.

523,974.—CLAMP—A. J. Courtney, Pine Ridge, Cal.

523,976.—NUTLOCK—P. W. Dillon, Davenport, Wash.

523,979.—CARTRIDGE—M. H. Durst, Wheatland, Cal.

523,983.—FOLDING BED—S. Hawver, University, Cal.

524,171.—ROWLOCK—J. T. Ish, S. F.

524,147.—BUTTER MOLD—H. S. Maltby, Clarksville, Cal.

524,297.—GAME—R. J. Rolfson, S. F.

524,293.—RAILWAY RAIL JOINT—L. H. Woolley, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ADJUSTABLE BUTTER MOLD.—Herbert Sanford Malthy of Clarksville, California. No. 524,147. Dated Aug. 7, 1894. The invention in this mold lies in adjustahly connecting its sections, in order to regulate its capacity to any required weight. In hutter molding it is necessary to compensate for difference in weight, dependent upon changes in temperature and upou the swelling of the mold. The dairyman has often to buy new molds and undertake the difficult operation of cutting them to proper size, in order to fill orders for given weights of rolls; and even this is an imperfect expedient, as a change in temperature or the swelling of the mold will disarrange his calculation. By the use of this mold the dairyman can, hy means of its adjustahly connected sections, accurately compensate for the changes due to temperature and swelling.

Every Inventor Wants a Good Patent

Or none at all. To secure the best patents Inventors bave only to address DEWEY & Co., Pioneer Patent Agents, No. 220 Market St., San Francisco.

There are many good reasons why Pacific Coast Inventors should patronize this Home Agency.

It is the ahlest, largest, best, most convenient, economical and speedy for all Pacific Coast patrons.

It is the oldest on this side of the American continent, most experienced, and in every way reliahle.

Conducted from 1863 by its present owners (A. T. Dewey, W. B. Ewer and Gco. H. Strong), tbis agency has the hest knowledge of patents already issued and of the state of the arts in all lines of inventions most common on this coast.

Patents secured in the United States, Canada, Mexico, all British colonies and provinces, England and other civilized countries throughout the globe.

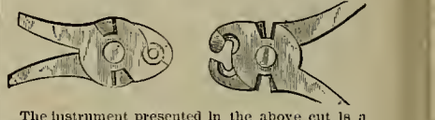
Caveats filed, assignments duly prepared, examinations made, and a general Patent Agency business conducted.

Established and successfully and popularly conducted for nearly thirty years, our patrons number many tbousands, to whom we refer with confidence, as men of influence and reliahility. Old and new inventors are cordially offered tbe complimentary use of our library and free advice, etc. No other agency can afford Pacific States inventors balf the advantages possessed by this old, well-tried and experienced firm.

The Deepest Hole in the Ground.

The deepest borehole of the earth is the oue at Poroschowitz, in the Rybuik district, Upper Silesia. It has been carried to a depth of something beyond 2000 meters (about 6700 feet) and the diameter of the tube at the bottom is seven ceutimeters. Boring to such depth and moreover through solid rock was almost impossible prior to the invention of the Mannesmann tube; the greater strength of this tube, as compared with others, makes it possible to use tubes of thinner gauge.[1] It is expected that a final depth of yet another 500 meters (some 1670 feet) can be reached, and a number of interesting observations on temperature, etc., will be made.—Loudon Engineering.

GIANT POWDER FURE CAP FASTENER.



The instrument presented in the above cut is a new and grand little invention; being designed to save life and limb, and innumerable lawsuits, by doing away with the dangerous operation of digging out wet and unexploded loads where Giant Powder is used in mining. The instrument crimps the cap on the end of the fuse, *firmly* and *absolutely water tight*. There is also a Fuse Cutter attached. They are neatly gotten up, of the finest cast steel, and nickel plated. Price $1.50 each.

MOODEY & SHERWOOD, Fresno, Cal.

G. W. PENNINGTON & SONS' STEEL WORKS.

Manufacturers of

Best Refined Cast Tool Steel.

Machinery and Hammer Steel, Steel Piston Rods, Steamboat Shafts, Dredger Buckets, Shear Blades, Lathe Spindles, and all kinds of Steel Forgings Made to Order.

Office and Works:

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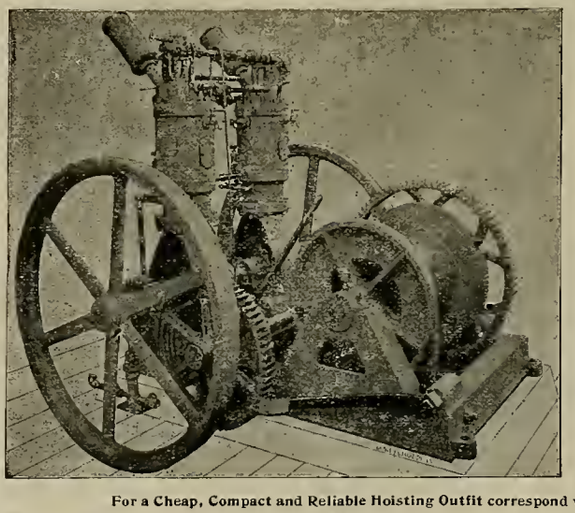


The Golden Gate Gas Engine

is not a new comer, but has not been advertised in the papers as some others. If you are in need of a Gas Engine, just ask anyone whoever has anything to do with them, and they will tell you:

Get the Golden Gate.

USES GAS or GASOLINE.

For a Cheap, Compact and Reliable Hoisting Outfit correspond with

Adam Schilling & Sons,

211-213 MAIN St., San Francisco,

The "GOLDEN GATE" is made strictly according to its own Letters Patent Issued.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Bullion M Co, Nevada	43	15c	Aug 7, Sept 13, Oct 4	R R Grayson, 331 Pine
Challar M Co, Nev	39	20c	Aug 9, Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27, Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17, Aug 24, Sept 21	C C Harvey, 309 Montgomery
Osborn Hill G M Co, Cal	3	15c	July 7, Aug 7, Aug 28	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17, Aug 21, Sept 11	G D Edwards, 414 California
Potosi M Co, Nev	42	25c	Aug 2, Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24, Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	30c	July 27, Aug 30, Sept 19	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18, Aug 23, Sept 11	E L Parker, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31, Sept 11, Oct 2	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2, Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Meeting.	Secretary and Office in S. F.	Date.
Independence M Co, Nev	Annual	J W Pew, 310 Pine	Aug 20

Coast Industrial Notes.

—Oregon's wool clip this year is estimated at 18,000,000 pounds.

—Placer county has voted $80,000 bonds for building its new courthouse.

—The city of Vallejo wants to be lit by electricity and invites proposals therefor.

—The Seattle Consolidated Railway Company has run behind over $25,000 in the last six months.

Lynd & Hough have built a gasoline schooner at California City for their northwestern codfish trade.

—The timber belt of Humboldt and Mendocino counties embraces 4125 square miles, containing 132,000,000,000 feet of timber.

The Interstate Fair opened at Tacoma, Washington, on last Wednesday. Montana, Idaho, Oregon, Washington, the Province of British Columbia and the Territory of Alaska are the exhibitors.

The California Wine Association has filed articles of incorporation; capital stock $10,000,000, of which $2,600,000 has been subscribed for by the following firms: Arpad Haraszthy & Co., $300,000; C. Carpy & Co., $300,000; Kohler & Van Bergen, $400,000; Kohler & Frohling, $300,000; Napa Valley Wine Co., $400,000; H. Lachman & Co., $500,000; B. Dreyfus & Co., $400,000.

—The river and harbor appropriation bill, which has been agreed to in both Houses, provides for a new project—a boat railroad to overcome the obstructions at The Dalles, on the Columbia river in Oregon and Washington. The project contemplates a hydraulic lift to raise steamboats out of the water, placing them upon a tramway car running upon eight or more tracks, transporting them thirteen miles and returning them to the water. The estimated cost is $2,000,000.

—At a recent meeting of the California Electric Light Company, it was decided to call in its stock in exchange for stock in the Edison Light and Power Co. The former owns 10,750 shares in the latter company. The Edison Co.'s incorporated capital is $3,000,000; 10,000 of its 20,000 shares have hitherto been unissued. In exchange, holders of Cal. Elect. Light Co.'s stock get one share for 4.65 shares of their stock and a 40 cent per share dividend. They also get last Wednesday's 66⅔ cents per share dividend declared by the Edison Light and Power Co.

NOTICE OF ASSESSMENT.

GOULD AND CURRY SILVER MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given that at a meeting of the board of directors, held on the 24th day of July, 1894, an assessment, No. 74, of fifteen (15) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary at the office of the company, room 60, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 20th day of August, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 21st day of September, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the board of directors.

ALFRED K. DURROW, Secretary.

Office—Room 60, Nevada block, 309 Montgomery street, San Francisco, Cal.

No. 6.

FRASER & CHALMERS, CHICAGO, ILL., U. S. A.

Also 43 Threadneedle St., E. C., London, England.

BRANCH OFFICES:

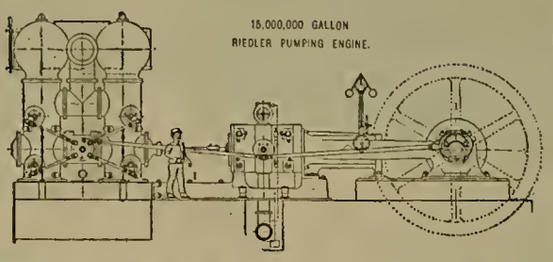
2 Wall St., New York; City of Mexico, Mexico; Salt Lake City, Utah; Helena, Montana; 527 17th St., opposite Denver Club, Denver, Colo.

We have in preparation an interesting pamphlet giving numerous cuts and descriptions of RIEDLER Pumping Engines and Air Compressors in America and Europe.

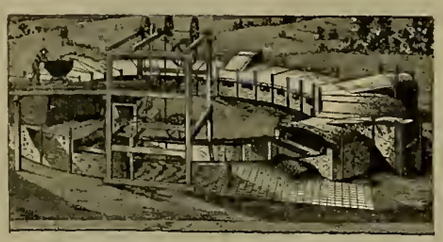
Let us book your address to receive this on publication.

Metallurgists are invited to send for our pamphlet explaining the great merits and economy in use of the

Horace F. Brown Horseshoe Roasting Furnace.



15,000,000 GALLON RIEDLER PUMPING ENGINE.



Crushers, Hoists,
Pumping Engines, Corliss Engines,
Boilers, Mechanical Stokers,
Lead Smelters, Pyritic Smelters,
Gold Mills, Silver Mills,
Mill and Mine Supplies.

WATCH FOR NEXT WEEK'S AD.

CASCADE WATER WHEEL

EMBODYING IN PRINCIPLE, THE
HURDY-GURDY or IMPULSE WHEEL.
ADAPTED TO ALL HEADS,
FROM 30 FEET TO 2000 FEET.

Our experience of **33 YEARS** in the water wheel business enables us to suit every requirement of Water Power Plants. Send for Illustrated Pamphlet.

JAMES LEFFEL & CO. SPRINGFIELD, OHIO, U. S. A. OR NEW YORK CITY.

Gold Quartz Mine For Sale.

A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which ten-dollar rock is now being crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

DEWEY & CO., PATENT SOLICITORS.

220 Market St., San Francisco, Cal.

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

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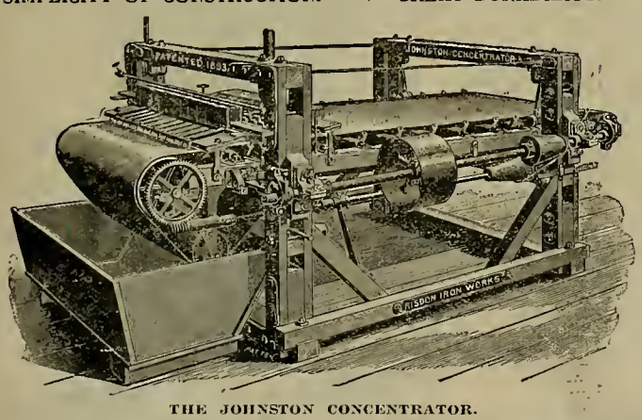
SIMPLICITY OF CONSTRUCTION. ✦✦ GREAT DURABILITY. ✦✦ EASE OF OPERATION. ✦✦ INCREASED PERCENTAGE OF SULPHURETS SAVED.



THE JOHNSTON CONCENTRATOR.

THE HUDSON GOLD MINING CO., WARD, COLORADO, June 8, 1894.

RISDON IRON WORKS, San Francisco—GENTLEMEN:—After a thorough test of the Johnston Concentrator, I am so well satisfied that I wired you to ship me two more as speedily as possible. I find the machine well constructed, easily kept in order, requiring but little attention, and doing entirely satisfactory work on our ore. After my experience with other tables, I am congratulating myself on my possession of the Johnston. Yours faithfully,

B. LANGRIDGE, Ph. D., Mining Engineer.

(COPY.) SAN FRANCISCO, CAL., June 1, 1894.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco:

GENTLEMEN:—We have tested the Johnston Concentrator furnished us by you on trial; and after an exhaustive test, we are satisfied it is the best in the market. Please prepare and ship us, as soon as possible, THIRTEEN more machines. Yours truly, APOLLO CONS. MINING CO.

[Signed.] By LEON SLOSS.

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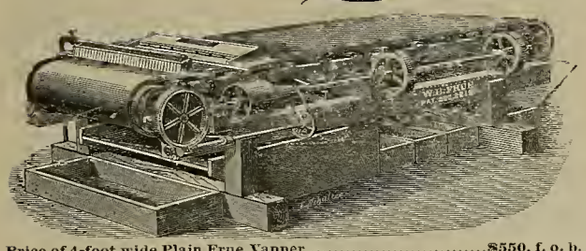

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

—o—

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(Successor to ADAMS & CARTER,)

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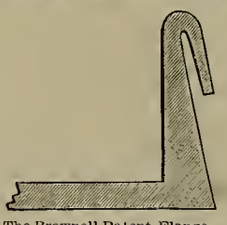
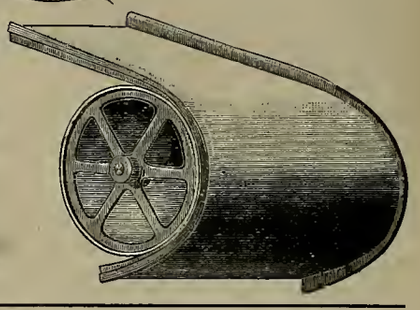


The Brownell Patent Flange.



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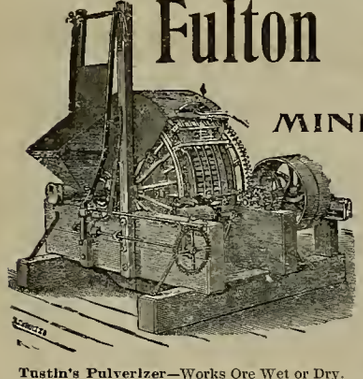

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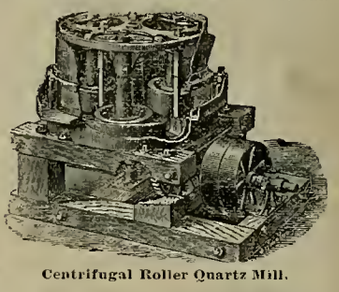

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MINING AND SCIENTIFIC PRESS.

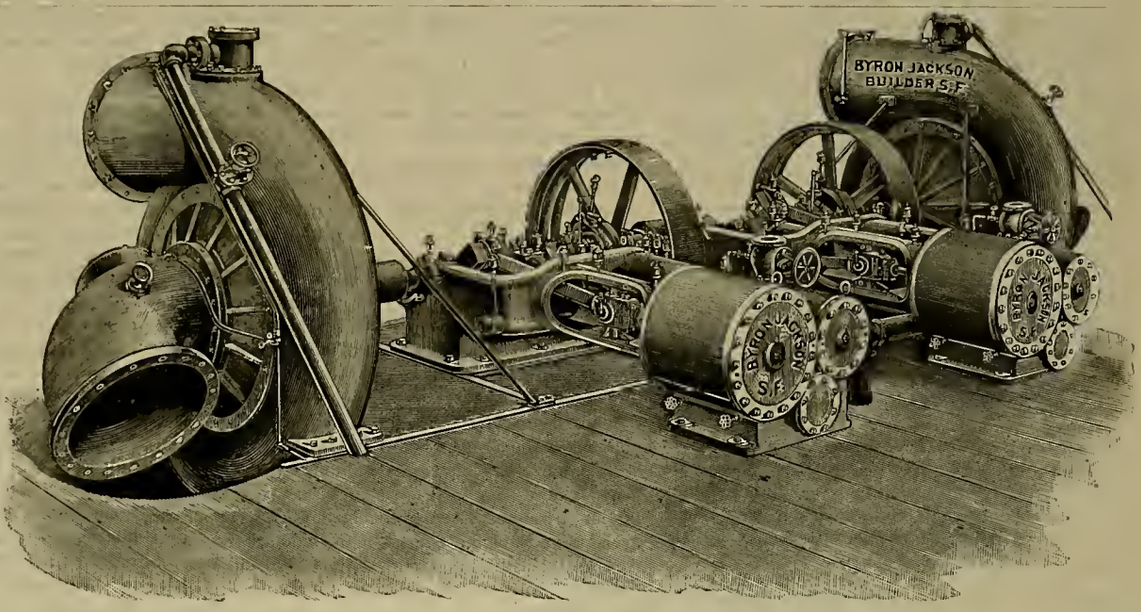
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 8. SAN FRANCISCO, SATURDAY, AUGUST 25, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Portable Electric Hoists.

The style of hoist illustrated below is mounted on wheels for moving about on temporary work, though it is equally well adapted for permanent use. It is compact, yet access to all parts needing adjustment or attention is easy. These hoists are convenient for use in tunnels for winze work or for prospecting purposes at a distance from the central station. At one end the drum is fitted with and actuated by a powerful wood-lined friction band clutch brought into play by a hand lever which is convenient to the operator. At the other end of the drum is fitted a band brake very similar to the clutch band and operated by a powerful foot lever. By means of this lever the load can be lowered at any desired speed or quickly brought to rest.

The motor is an adaptation of the railway type, with its frame so arranged as to be a part of the bed plate of the hoist. The rheostat and controller for regulating the speed of the hoist are operated by means of a lever. The pinion on the motor shaft and the intermediate gear engaging it have machine-cut teeth and are entirely inclosed in a case which will hold grease, thus reducing the noise, furnishing ample lubrication and protecting the gears from dirt and injury. The insulation of all the electrical parts is good. All parts carrying current are specially insulated and heavily waterproofed, and where possible completely encased.



DUPLICATE PUMPING PLANT.

Duplicate Pumping Plant.

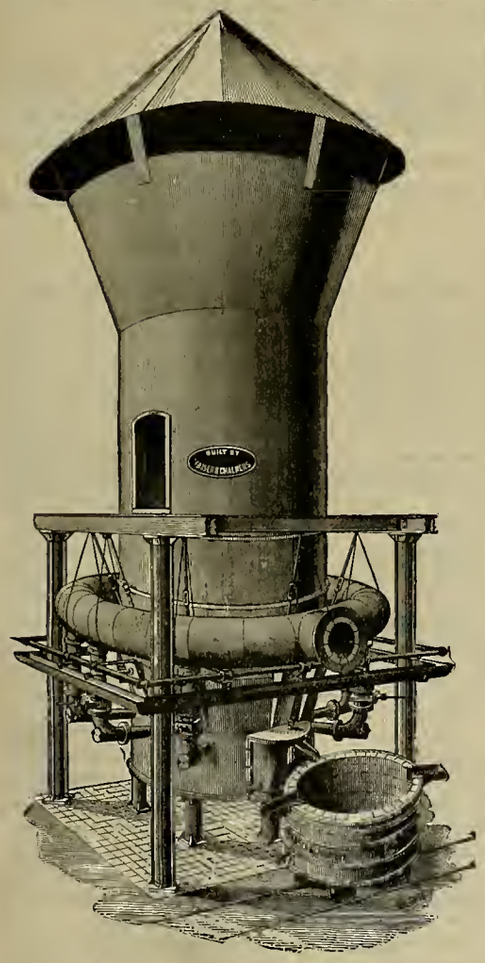
The upper illustration on this page is of a duplicate pumping plant, 200 to 300 H. P. Capacity, 45,000 to 60,000 gallons per minute; maximum lift, twenty feet. Either engine can be connected to one or both pumps. View made before shipment of plant; erected on Merritt island, Sacramento river, for Swamp Land District No. 150.

THE Central copper mine which closed last week in Keweenaw county, Michigan, after a continuous operation of forty years, returned to its stockholders $2,000,000 in dividends on an investment of $100,000.

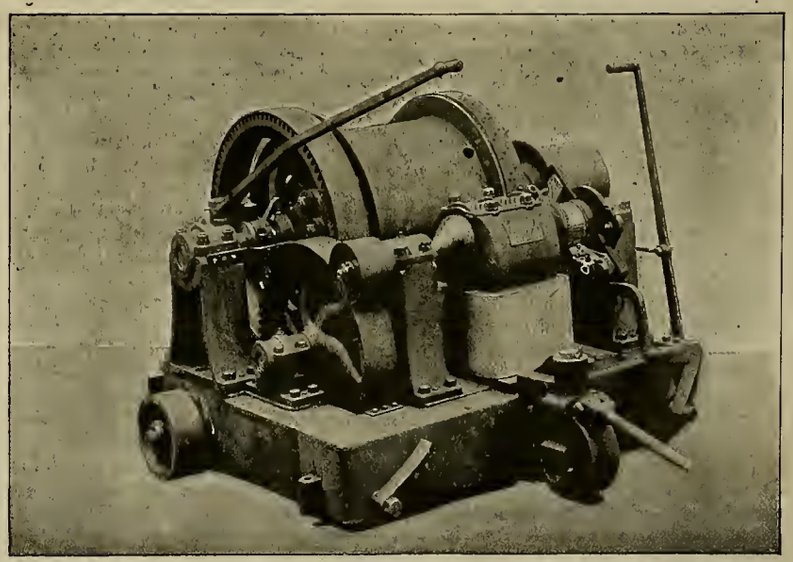
INCREASED activity in hydraulic mining is reported from the Klamath river valley, which is unaffected by anti-debris legislation. Considerable foreign capital has recently found investment there.

The Austin Pyritic Smelter.

Herewith is given an illustration of the pyritic smelter, recently put on the market by Fraser & Chalmers. Briefly stated the idea put into practice in the apparatus is to treat sulphide ores by means of heat produced from the iron and sulphur contained therein, thus avoiding the use of carbonaceous fuel, the roasting of the ores, etc. It is claimed that there is great additional advantage in the increased capacity of furnaces, exceeding that of ordinary copper smelters of like dimensions fifty per cent. Time is also reported saved in the new process. The fusibility of sulphides of iron is an important element, melting before the air blast, and by the intense heat developed fusing the ore above. A full description of the process was recently published in these columns, and no further present mention is necessary beyond reference to the general appearance of the new smelter.



THE AUSTIN PYRITIC SMELTER.



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Large advertisements at favorable rates. Special or reading notices, legal advertisements, notices appearing in extraordinary type, or in particular parts of the paper, at special rates. Four insertions are rated in a month.

Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, August 25, 1894.

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THE Canadian Pacific Railway Co. is reported intending to use electricity for motive power on its mountain division.

THE Grass Valley *Telegraph* says: "There are idle miners enough around here to run a dozen more mines." Probably that has something to do with the present attempt to reduce the wages of the North Star and Empire employes.

RECENTLY a Californian with mining property to dispose of, sent a modestly worded advertisement to the MINING AND SCIENTIFIC PRESS for insertion for one month. After the second insertion he writes that the advertisement has sold his mine.

A RICH GOLD STRIKE is reported in Anderoy valley, about forty miles northeast of Fresno, Cal. Considerable placer gold was obtained in that vicinity many years ago. The discovery has stimulated activity in that section, there being many undeveloped quartz claims in the vicinity.

FROM St. Louis, Mo., comes a statement that a local genius "has succeeded in so concentrating the electric light that it will illumine the brain." As the new tariff law goes into effect next Monday, it would seem that the praiseworthy efforts of the St. Louis man are too tardy to be effective in the case of present Congressmen.

A TRANSFER is announced which may have considerable influence on electrical operations. The Wenstrom Electrical Company of Baltimore, with a capital stock of $1,000,000, has sold out to the Fort Wayne Electric Company of Fort Wayne, Ind., thus putting that company in control of certain patents which are reported to have been infringed by other electric manufacturers. The Fort Wayne Company, it is said, will demand an accounting from all who are reported as having infringed upon its patents.

THE monetary feature of the week has been the advance of nearly four cents an ounce in the price of silver. It is believed that while the Chinese war is the present cause of the notable advance, yet remote and underlying causes will insure a steady advance in price toward its old-time ratio. The continued depression in the price of the white metal has occasioned so general a cessation of silver mining, that it will be some time before even a prolonged hardening of the market will induce general resumption of work on the part of many who have turned their attention to the development of gold properties. The industrial effect will, however, be most gratifying, for however specious the theories of the monometallist, the fact is evident that the country cannot recover its business elasticity till silver approximates the position it so long held in the business world.

Pending Legislation.

It was Gen. Hancock who said: "The tariff is a local issue," and although that remark contributed as much as anything else to his defeat yet there was considerable truth in the assertion. Other things than the tariff partake of the nature of "a local issue," among them, mining legislation. When the recent suspension of assessment bill was pending it was warmly endorsed by some sections and strenuously opposed by others. The territory affected by the laws of Congress is so extensive and diversified that it is the rule rather than the exception to have the same measures viewed very differently by people whose interests are not identical, locally. The bill now before the Senate, having passed the House, is a case in point.

On February 17th, '94, a bill was introduced by Congressman Newlands of Nevada, at the request of the California Miners' Association, amending the Revised Statutes, California having no representative in the House Committee on Mines and Mining, to which committee it was referred. The amendments proposed in chapter 6, title 32 of the Revised Statutes, while prejudicial to no mining interest, were calculated to be of direct benefit to all, as heretofore shown in these columns. One clause in particular says: "* * * * And provided further, that whenever land is proven to be a well-defined mineral belt, such land shall be deemed, presumed and taken to be, and always to have been, mineral land, unless the contrary is proven," etc. That "always to have been" seems to have been successfully objected to, so far as the House is concerned; for, in a bill favorably recommended by the House Committee on Mines and Mining, and which is now pending in the Senate, being before the Public Land Committee, that clause is eliminated. It is manifestly a necessary provision to preserve intact, so far as possible, the encroachments of corporate greed upon the mineral area of this and other States. At the October '93 meeting of the California Miners' Association in this city this was fully and clearly demonstrated.

The MINING AND SCIENTIFIC PRESS is able to partially explain some of the action that resulted in the passage by the House of the bill in its present shape. When introducing the bill now under discussion, Congressman Caminetti explained that the object was to define the rules of evidence in regard to mineral and other kinds of land; there was no attempt to injure or interfere with anybody or anybody's rights, but simply a desire to equalize and make possible a greater measure of justice than existed or exists.

The bill was subjected to very close scrutiny before the Committee on Mines and Mining, and Rawlins of Utah, who is a member of the committee, moved to strike out the clause providing that any land within a well-defined mineral belt should be presumed to be mineral land. It seems that at Eureka, Utah, there is a contest between the owners of the townsite and applicants for mineral patents to some of the included ground, and the townsite owners got delegate Rawlins to argue that "a mineral belt is indefinable." The clause was stricken out, but Congressman Caminetti was successful in getting it restored, with a proviso exempting Utah from its provisions. Then Congressman Pickler, of South Dakota, had an amendment added providing that none of the enactment should be applicable to contests pending. Others whose names are not reported got in further "fine work" with the bill, which in its present condition needs some prompt and effective action on the part of those interested in seeing that California mining interests receive the same full consideration that has been awarded the representatives of other sections.

THE British South Africa Company has issued a set of official regulations which make curious reading to an American. Before one can do any prospecting, he must sign an agreement to obey all the laws of the company and fight, if necessary, for the maintenance of law and order. That costs a shilling. The license then issued permits him to "peg off" one placer claim (called "alluvial" claim in South Africa) and ten quartz "reef" claims, a certificate for that costing sixty cents. The placer claim is limited to 150 feet square, the quartz ledges 150 feet along the ledge and 200 feet each side. He can follow the ledge in all its dips, spurs, angles and sinuosities. Within four months he must sink a shaft at least thirty feet in the ledge or alongside crosscutting it, the company owning half the claim without sharing any of the expense, and its consent being necessary before the miner can transfer his half. In a placer claim $5 per month must be paid. The miner has neither voice nor vote in any public transaction.

The "Knot" and the Mile.

An inland reader writes regarding the term "knot," in an editorial in last week's issue about the battleship Oregon, and says that he understands a "knot" to be 6082 feet in length, a statute mile being 5280 feet, and that if the battleship Oregon attains a speed of seventeen knots that would be 19.6 miles. The statement is correct, excepting the inexact use of the term "knot." As this misuse is common, a word regarding it may be in place. As a matter of fact there is no such distance as a "knot." We have miles, leagues, etc., which are regularly defined distances, but a "knot" can correctly be used only in determining the rate of speed at which a vessel moves in the water. The confusion partly arises in the relation or proportion between a nautical mile and a statute mile. True, it may be argued that the distance between two knots on the logline is 6082 feet, and hence a "knot" is 6082 feet, but that is a confounding of terms. In this regard the distance may be thus stated. A mile is a mile, regardless of time, while a "knot" is always correctly spoken of in connection with time.

Received an Award.

The following, coming from the source it does, is appreciated. It is a copy of an official communication received last Wednesday from the Executive Committee on Awards of the World's Columbian Exhibition last year at Chicago. Seldom has a journal received a higher compliment from a more distinguished source, and though the MINING AND SCIENTIFIC PRESS rarely reprints the many appreciative notices it receives, (though they are none the less highly appreciated), it gives place to the following:

UNITED STATES.

DEPARTMENT E.—MINES AND MINING. 22,708
Group 67. Class 411.

Exhibit—THE MINING AND SCIENTIFIC PRESS.

AWARD.

The general reliability of its news, and the clear and intelligent editorials therein. It consists of several numbers of the journal named. This journal is favorably known for the fullness and accuracy of its weekly reports of the progress of mining on the Pacific coast.

(Signed) WM. C. DAY, Individual Judge.

Approved: H. M. HOWE,
President Departmental Committee.

Approved: JOHN BOYD THATCHER,
Chairman Executive Committee on Awards.

Two Recent Decisions.

Elsewhere appears the full text of the decisions in two cases which attract considerable attention in the mining world. It is felt that their importance justifies their publication in full, as they will be needed in convenient form for reference. The maps accompanying have been engraved especially to accompany the text of the decisions for fuller understanding of the subject. It would have been our further pleasure to have illustrated the admirable model prepared by W. F. Englebright, M. E., of Nevada City, Cal., which did so much to elucidate the subject when argued before the Court, but after two attempts it was found that no illustration could do justice to the ingenious original. The model elicited universal commendation, and reflects credit on its contriver, being a complete exhibit of the workings in dispute.

Bond Shipments.

Up to the present time as regards foreign lead ores, Mexico has had an advantage over British Columbia. The Omaha & Grant smelter at Omaha is a bonded warehouse, and under that arrangement Mexican lead ore has been shipped across the line in bond, refined into bullion and exported without paying one cent of duty. Recently on one shipment from Mexican mines to Omaha the customs duties would have been $40,000 were the same rule applied as is to British Columbia ore. Without the advantage mentioned, the Omaha smelter would have had to pay

the $40,000, be out the use of it for ninety days, subsequently getting it back in rebate minus one per cent government charges. The British Columbia mines haven't that special arrangement of shipping direct in bond and reshipping the product without temporary tariff payments.

A PHILADELPHIA contemporary, commenting on the list of July mining dividends in this paper, speaks in a way that justifies the inference of its belief that that list represents all the mining dividends of the country. Not a hundredth part of them. It is simply an approximately correct list of dividends declared by large incorporated companies, many of whom advertise their dividends and all of whom give publicity for business reasons to the fact that such dividend was declared. But for every mine listed or incorporated there is a hundred regarding which no proclamation is made of the dividends or profit, chiefly owned by private individuals who do not care to announce their gains. They are working the mine for all that is in it, *i. e.*, in the mine, and what they make is not a subject of public knowledge. There are many gold mines in this State, for instance, paying enormously, some as high as $100,000 a month, and many more paying from $1000 a month up to $10,000, that are not making much noise about it. Yet it is these mines that make up the bulk of the aggregate of California's annual gold yield, and it is these mines that make up in a great measure the prosperity of the mining regions. The money goes out to the men at work, the merchants, the dealers in supplies, etc., the profits are expended in different ways by the owners, thus diffusing general prosperity.

Concentrates.

THE *Record* says a miner must be Colorado's next Governor

PLACER mines in Cripple Creek, Col., pay the city a royalty of 25 per cent.

THE Challis, Idaho, *Messenger* says the Yellow Jacket will give work to 500 men this fall.

THE Nevada County Miners' Association will hold its annual meeting in Nevada City next Thursday.

THE Bland Tunnel Co. has been organized at Cochiti, N. M., with $1,000,000 capital, to pierce Gold Hill at a depth of 1000 feet.

THE old Constitution mine on Deer creek, Nevada Co., has been purchased by William Floyd and others, who will open it up.

A RICH STRIKE is reported in the Frisco mine at Bingham, Utah. Assays show 223 ounces silver, 28 per cent lead and $2.90 gold.

THE hoisting works at the Eagle Bird mine at Mayhert, Nevada Co., were destroyed by fire last week. It will be immediately rebuilt.

JACK MCKINNON reports that he is sharpening drills for a mining company at Johannesburg, South Africa, and making $250 per month thereat.

THE Eureka Mining Co., at West Point, Calaveras county, has struck a large ledge showing well in free gold and sulphurets in the bottom of the mine.

THE *Mercury* says that A. McNair has the richest quartz mine in Butte county, fourteen miles from Oroville, and that $1800 was taken out in one day last week.

ONE THOUSAND tons of ore from the Tiger mine at Burke, Idaho, are on the way to the Tacoma smelter. The ore carries forty ounces in silver and sixty-five per cent lead.

ROSEMOND, the new copper mine in the Santa Rita mountains, Arizona, gives promise of becoming a big producer of copper. Employment is given to a large number of men.

THE *New Era* says that Kennedy will teach the State of Nevada a lesson in the cheap reduction of ores. The operators now in that camp are men with experience in progressive mining.

FORTY tons of ore that had been thrown over the dump as worthless at the Japan mine, near Telluride, Col., when put through an ordinary gig and shipped to the smelter brought over $6000.

THE reward now offered for the murderers of Kneehone, the Gem, Idaho, blacksmith, is $7300. The State of Idaho offers $5000, Shoshone county $1000, and the sheriff of Shoshone county $1300.

THE Tintic, Utah, *Miner* says gold-hunters returning from Uintah are very much disgusted with that district. From their description of the country it is a good one for prospectors to keep out of.

BY a new siphon scheme for mining the bed of the Arkansas river at Granite, Colorado, it is expected to move and deposit into sluice-boxes over 3000 cubic yards of material every twenty-four hours.

B. WIRT, of Omaha, president of the Ben-Hur mine, was shot through both arms near Victor, Col., last Tuesday by six men with Winchesters, who, it is said, mistook him for the Cripple Creek sheriff.

THE Loomiston, Wash., *Journal* says that a cleanup at the Carrihoo mine at Camp McKinney last week resulted well. Nineteen days of a run gave the result of 37½ ounces of gold, or between $9000 and $10,000.

In Sierra county the Butte Saddle G. M. Co., Sierra City, has levied an assessment, No. 11, of one cent a share; and the Yeang America G. M. Co., Forest City, has levied an assessment, No. 8, of two mills a share.

THE Montreal Mining Co. has ordered a forty-stamp mill for the Viertong mine, near Tuttletown, Cal., and has thirty-five men at work. The *Herald* says it is expected to have 500 men at work in and around the mine in a month.

DURING the past year in Montana, the Parrot Company mined 53,155 tons of ore at a cost of $184,575; Heinze's Glengarry extracted 17,000 tons at a cost of $51,000, and Clark's Colusa-Parrot 16,000 tons at a cost of $32,000.

THE Cripple Creek *Miner* says that the statement of the Colorado Springs *Gazette*, that the miners are on the verge of another war, is absolutely false. A large majority of the miners are at work, and the few agitators no longer have influence.

REGARDING the Champion mine at Nevada City, the *Transcript* says the company will this week be able to start up their works and give employment in a short time to as large a number of men as they ever did, and the people there are happy over the fact.

AT the Anita mine in Florencia district near Oaxaca, Mexico, last week a fight occurred between John Merritt, the American superintendent and his four assistants and about fifty Mexican miners. Merritt and three Mexicans were killed. Merritt came from Denver.

R. B. WOODWARD, a director of the Bodie Consolidated Mining Company, has been sued by W. E. Miles for the $1000 penalty prescribed by law for the failure to make a weekly report to its stockholders of wages paid, work done, ore raised and bullion received or sold.

THE lithographic stone quarries near the head of Sycamore creek, forty miles from Prescott, Arizona, are reported developed sufficiently to reveal immense deposits of that valuable stone. C. P. Sykes has expended about $5000 on them during the last eighteen months.

THE receipts of ore and bullion in Salt Lake City for the week ending August 16th were to the aggregate value of $119,946, of which $74,650 was in ore and $45,296 in bullion. For the previous week the receipts were $83,627, of which $60,331 was in ore and $23,296 in bullion.

AT the Gwin mine work has been temporarily suspended upon the shaft to resume with the new machinery which will be placed in position this week. The company is building a telephone line from the mine to Jackson, to connect at Marre's with the other lines in the county.

THE Texas mine near Willow valley, Nevada county, is reported coming to the front again. There are several ledges on the 120 acres of patented ground, and the present owners have returns that are believed to justify putting up a twenty-stamp mill and chlorination works.

A FIRE broke out in the blacksmith shop of the Standard Consolidated Mining Company's hoisting works last Sunday, destroying the whole property, together with all the lumber, wood and coal. No one was injured, the miners escaping through the Bulwer tunnel. The loss is over $100,000, partially insured.

THE Plumas Imperial Gold Mining Company has bought C. R. Thompson's interest in the Emigrant Hill mines, including the Fairstake and other properties. Nearly a year ago the same company purchased the half interest of F. E. Thomas. This transfer gives the corporation the control of an extensive and valuable property.

THE Veta Madre mine, on Seobers hill, near Jackson, Cal., has been bonded to a San Francisco company. The first payment of $1000 is to be made in November, the second of $4000 in November, 1895, the third of $5000 in November, 1896, and the last payment of $20,000 in 1897. A contract will be let for sinking a shaft 500 feet deep.

MEN are actively prospecting the ruby sand deposits around and south of Yakutat, in northwestern Alaska. A San Francisco man is there with a machine of his own invention which he claims will work the gold-bearing sands in greater quantities and save more gold than the sluice-boxes with quicksilver riffles and copper plates for the undercurrent.

THE largest alternating current synchronous electric motor in the United States is owned by the San Miguel Consolidated Mining and Milling Company of Telluride, and it is constantly used to furnish power to the mines and mills of the company, as well as to furnish mills belonging to syndicates and individuals throughout the county, says the Telluride *Journal*.

THE Cripple Creek, Col., Gold Milling Company has decided to make additions to the Gold & Globe mill. A 200-ton sampler is to be added and also a chlorination plant to extract the gold from the plates and humping tables. The company has decided that this is the most advantageous method of treating the ores of the camp. About $35,000 will be expended.

THE Nevada *Herald* says: Dividend No. 30 has been declared by the Omaha Consolidated Mining Company. The amount is 15 cents per share on capital stock. There is considerable improvement in the appearance of the mine of late, and the chances are that further developments in the Lone Jack (adjoining the Omaha and owned by that company) will show far greater improvements.

IT is understood that the restraining order in the suit of A. Walrath et al. against the Champion Gold Mining Company has been modified so as to allow the Champion Company to extract ore from the contact ledge southerly at all points of a vertical plane drawn through the northern end of the line of the Providence mine, and to allow the latter to extract ore northerly at all points of the vertical plane.

THE Harqua Hala, Arizona, continues to turn out about $35,000 a month with forty stamps. The company now has sixty men in its employ, about half the miners being foreigners. Wages paid are $3 a day for first-class men. The deepest working is now 350 feet, and the mine bears every sign of being good for many years to come. The camp is in the midst of the desert and life there is monotonous.

THE men employed at the North Star and Empire mines, Grass Valley, were notified last Monday evening that their wages would be cut—the men receiving $3 a day to $2.50, the $2.50 men to $2.25 and the $2.25 men to $2. On Wednesday night a meeting of miners was held at Grass Valley, which was addressed by several regarding the proposed cut. It was agreed to quit work if the reduction is made, and resolutions were adopted asking every candidate for the Assembly to pledge his support to a bill to abolish compulsory trading at company stores. Several miners joined the Miners' Union. It was understood that the proposed reduction would be in force on the first of September.

THE suit of the Argonaut Mining Company against the Kennedy Mining and Milling Company has been begun. The plaintiff alleges that the defendant company has trespassed on its grounds and unlawfully taken ore, and asks judgment for $325,000, costs of suit, a temporary injunction against trespassers pending the suit, a perpetual injunction against trespass, and such other and further relief as may be just.

THERE were shipped from Georgetown, Col., during the month of July, sixty-seven cars of ore, containing 1,337,000 pounds, of a value of $93,480. Thirty-nine cars were shipped to Denver, one to Argo and twenty-seven to Pueblo. There were shipped from Empire during the same month eight cars, containing 188,000 pounds of ore, valued at $27,900. Three cars were shipped to Denver, three to Argo and two to Idaho Springs.

THE Mexican government has granted to Ferando de Leresa one of the most valuable mining concessions ever given in Mexico. It is for the working of the rich gold placers in several districts of the State of Oaxaca. The terms of the concession provide that $1,000,000 must be expended by the concessionaire within five years, and that he must erect reduction works capable of handling 400 tons of ore weekly within two years.

E. S. BAKER has bought two five-foot Huntington mills from the Sunflower mine, near Pike City, and will erect them on the Crane mine, at San Juan, Cal. The Crane is on the same ledge or formation as the Boss and the Resources, and is situated between the two. There will shortly be four, and possibly five, mills on the formation, which is about forty feet wide. They are near the town of Sweetland, and will make a lively camp.

L. M. BALDWIN was superintendent of the Valencia mines in Mexico in August, 1887. While making a tour of the mines he was fired on, was badly wounded and sought refuge in a tunnel. Mr. Baldwin surrendered himself, on promise that he would be allowed to pay a ransom and go free. The bandits hurried him down the road and in a few minutes shot him through the brain and disappeared. The Mexican Government has at last agreed to pay his widow $20,000.

THE Democratic State Convention, now in session in this city, adopted the following plank in its platform yesterday: We favor the enactment and enforcement of legislation placing the mining industry upon a basis of permanent prosperity, and are opposed to all unnecessary restraints upon the acquisition by our citizens of title to mineral lands. We favor National and State aid in the construction of such works as will promote hydraulic mining, and permit it to be carried on wherever it can be without material injury to vested rights.

GEO. W. WANLESS of Jimenez, Mexico, agent at that point for the Rio Grande Smelting Works, says that cinnabar exists in southwestern Texas, twelve miles from the Rio Grande, fifty or sixty miles from Presideno, and about eighty miles from Alpine, Texas. The cinnabar is reported in limestone associated with oxide of iron. The formation for two miles or more is horizontal. Upon determination the ore yielded as high as sulphur combines with mercury, and from that point down the scale value. No work has been done to date, the alleged discovery being in the elementary stages of development.

KENNEDY, Nev., is delighted over a big strike in the Imperial last Monday, which is interpreted to mean the permanency of the camp. The *New Era* says at a depth of 125 feet there is a solid ore body eight feet wide. A foot of the ore on the hanging wall is a clear, firm quartz, ribboned with metal, which gives $104.29 in gold, 15 ounces in silver, but no lead. The seven feet intervening to the foot wall is a mass of galena and the entire eight feet averages $20 in gold, 70 ounces in silver, and 40 per cent lead. The drift where a three-foot vein is opened returns $27.50 in gold, 17.75 ounces in silver, and five per cent lead. A concentrating test made of the ore from the north drift and bottom of the winze gave concentrates valued at $307 a ton, of which $45 was lead, $100 silver, and $162 gold, the lead reaching 72 per cent. Concentrates of this character would command a premium at any smelter. To the question, What is the Imperial mine? Manager J. F. Wardner answers: "An immense concentrating property of sulphurets of lead," and supports his statement by asserting that it will be proven the red oxide and pyrites of the surface are the iron capping of vast bodies of lead carrying gold and silver.

Personal.

W. C. RALSTON has returned from a business trip to Plumas county.

J. J. CRAWFORD, State Mineralogist, is making a personal investigation in Siskiyou county.

B. F. PEART, of this city, is the superintendent of the Viertong mine, near Tuttletown, Cal.

PROF. AUG. J. BOWIE, consulting engineer in charge of the Lemhi placers of Lemhi county, Idaho, is in Denver, Col.

CONGRESSMAN CAMINETTI of Amador received the merited recognition of a unanimous nomination from the Second Congressional District at the Democratic convention in this city last Wednesday.

COUNT DES GARETS, a grand nephew of Lafayette and L. Pelatan of Paris; J. H. Brotherton and A. M. Fletcher of London, having mines in Sierra county, California, and in Idaho, are visiting their property.

FELIX CHAPPELET is back from his Chili Gulch gravel property in Calaveras county, where a quartz ledge was recently cut by a tunnel. Mr. Chappelet inclines to the opinion that the ledge is an extension of the mother lode.

PROF. GUSTAV EISEN and Frank Vaslit of the Academy of Sciences leave to-day for a lengthened sojourn in Lower California and Sinaloa, Mexico. The expedition is purely a scientific one, and is justly expected to be rich in results.

SENATOR GEO. PERKINS is back from Washington. It was largely due to his efforts that the two-cent rate was put on borax in the new tariff law and the duty of seven cents on quicksilver which, though three cents less than the old rate, is better for the California producers of quicksilver than to have it free, as was at first proposed.

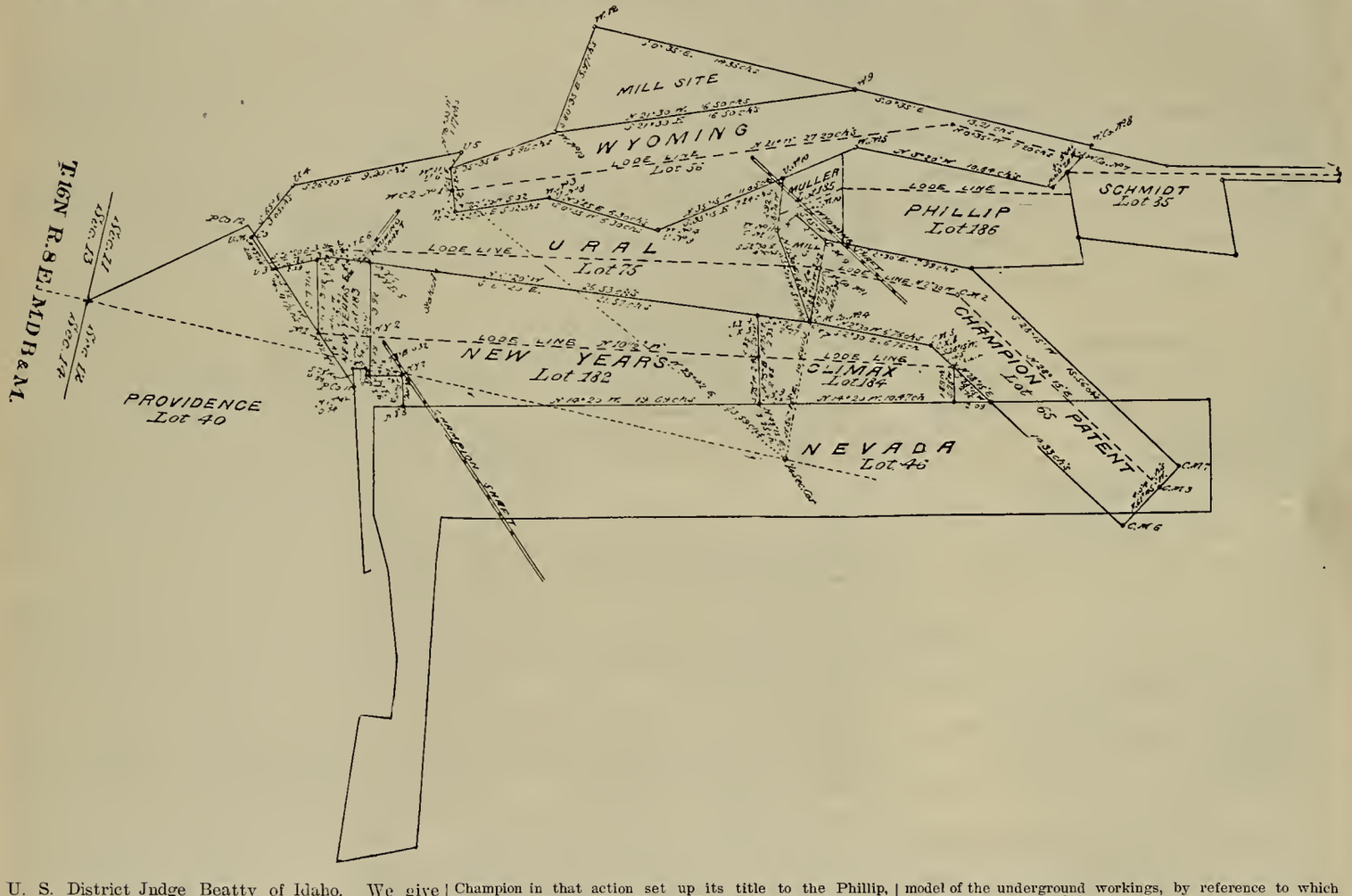
The Con. Wyoming-Champion Decision.

Consolidated Wyoming Gold Mining Company, Complainant, vs. Champion Mining Company, Respondent.—In the Circuit Court of the United States for the Ninth Circuit.

The trial of this canse began before Hon. Thos. P. Hawley, U. S. District Jndge for Nevada, at San Francisco on May 15, 1894, and continned until it was snbmitted on June 1, 1894, John M. Wright, Esq., of Oakland, and W. S. Wood, Esq., of San Francisco, representing the complainant, and Messrs. Lindley & Eickhoff and George Hoeffer, Esq., all of San Francisco, representing the respondent.

Because of the many important qnestions involved and settled, and particnlarly becanse it is the first jndicial interpretation of the now celebrated "Amy case," many attorneys consider this the most important mining case tried in any court in California since the debris question was settled.

The decision of Jndge Hawley was handed down Angnst 13, 1894, at San Francisco, being read by U. S. District Jndge Beatty of Idaho. We give the entire opinion below.



The snbject of extra lateral rights attaching to claims located prior to May 10, 1892, having nonparallel end lines, the subject of extra lateral rights where a lode passes into a claim through one end line and out across a side line, the subject of the uuion of veins on their dip as well as on their strike, and the subject of lode definition are all ably discussed and interpreted. The definition of a lode set forth follows closely that given by Prof. Ross E. Browne iu the testimony and is one of the most valuable to be fonnd in any of the cases.

The opinion is as follows:

This is an action of trespass, with a prayer for equitahle relief, for an accounting and an injunction.

It was commenced in the Superior Court of Nevada county and removed to this Court by respondent, upou the ground that it involved a construction of the United States statutes relating to miuing claims.

1. A motion was made by complainant to remand the cause to the State Court upon the ground that there was a prior judgmeut in the State Court hetween the same parties which left no issue to he litigated except the fact and extent of the trespass, and that no federal question was involved.

This motiou was denied and a plea in ahatement to the jurisdiction of this Court was overruled hy the Circuit judge.

Complainant is the owner of the Wyoming and Ural quartz lodes aud mines, for each of which it has a United States patent. The patent for the Wyoming lode was issued September 19, 1874, and is based upon a location, or occupancy, of the lode claim prior to 1872. The patent recites the fact that it is granted under the law of 1866, and the acts amendatory thereof of 1870 and 1872. It grants 2270 40-100 linear feet of the Wyoming lode and certain surface grcund which is particularly defined by metes and hounds. The patent to the Ural lode for 2000 linear feet and the surface ground was issued May 12, 1880. It recites tbe fact that it is issued under certain sections of the Revised Statutes of the Uuited States, which includes the statutes of 1866, 1870 and 1872. Both of said patents contain a grant of the mining premises substantially in the language of Section 2322, Revised Statutes United States.

The respondent is the owner of the New Years and New Years Extension, upon which it particularly relies, aud of the Climax and certain other claims which need not he specifically mentioned, and its title thereto is evidenced hy a certificate of purchase from the United States Land Office, which is admitted to he equivalent to a patent from the Government.

The title of claimant to its Wyoming and Ural claims is prior in point of time to that of respondent to its claims.

There is no dispute whatever as to the surface lines of the respective claims.

It is admitted hy claimant that, whatever its rights to the Wyoming and Ural lodes were prior to its application for a patent, when it had these claims surveyed by the United States surveyor and permitted him to draw the end lines it is estopped, under its patent, from any further claim outside of the lines that were fixed hy the surveyor, and that its extra lateral rights—which constitute the principal hone of contention in this case—are confined to planes drawn downward through the end lines of the survey and extended indefinitely, and that at a certain depth these end line planes would come together and its extra lateral rights would be entirely cut off.

The former judgment in the State Court was rendered in an action hrought hy the Champion Gold Mining Company (respondent in this action) against the Consolidated Wyoming Company (complainant here).

The trespass there alleged was upon the Phillip ground helonging to the Champion, which is not here involved—hut the Champion in that action set up its title to the Phillip, Champion, Climax, New Years, New Years Extension, and the Annex mining claims, and included the ground in controversy in this action.

The question of end lines was there in issue and the Court found that a certain course described in the pleadings was the course of the southern end line of the Ural quartz mine.

The question of the junction of the Wyoming and Ural lodes was also presented. The judgment in that case reads as follows: "Now, therefore, it is considered, adjudged and decreed that plaintiff have judgment against the defendant for the sum of one hundred and twenty dollars, with its costs therein expended up to the time of filing of the answer to the amended complaint; that plaintiff is not entitled to any injunction or other relief against defendant; that defendant is entitled to work its Wyoming mine along and all points helow the junction tbereof with the Phillips mine of plaintiff and it is entitled to work hoth its Wyoming and Ural mines at any point helow where either of said mines on its dip may unite with the New Years or Climax, or New Years Extension, or Annex mines of the plaintiff, and that defendant have and recover its costs herein expended since the filing of its said answer to amended complaint." An appeal was taken to the Supreme Court and the judgment was affirmed. Champion vs. Wyoming, 75 Cal., 78.

The admissihility of this judgment as evidence was passed upon by the Circuit Judge in deciding that this Court had jurisdiction of this case, and these questions will not he reviewed.

The above diagram shows the surface houndaries of the respective claims and the lode lines of the respective lodes as defined aud represented in the patents, and contains the stipulation of the parties in regard thereto and with reference to the former judgment hetween the same parties in the State Court.

The lode lines represented on this diagram are ideal, as distinguished from the actual lines of the lodes as shown hy the testimony. The line of outcropping of the Wyoming and Ural lodes with the underground workings of the Wyoming and Champion companies are shown upon diagram on the opposite page.

The outcrop of the respective lodes upon tbe surface is not continuous nor well defined, hut it has been exposed in a sufficient numher of places to sbow—when taken in connection with the underground workings—that the general course of the croppings as delineated on the diagram is substantially correct.

The apex of the Wyoming lode is clearly established within the surface houndries of the Wyoming claim and the lode extends throughout the entire length of said claim through the northern aud southern end lines thereof. The apex of the Ural is shown to he in the Ural claim aud the lode extends from the uortherly end line through the claim in a southerly direction for ahout 1400 fect and then crosses the eastern side line of the Ural, as delineated on the diagram, at a point ahout 600 feet from the southerly end line of the Ural surface location.

The walls of the Wyoming lode are hoth slate, and in the testimony the Wyoming is called the "slate" vein.

The Ural lode has a hanging wall of granite, or diorite, and the footwall is slate, and this is called the "contact" vein.

The slate vein extends dowuward into the earth at an angle of ahout 25 degrees to the southeast. The contact exteuds downward in the same general direction at an angle of ahout 35 degrees.

There are numerous controverted questions of fact, as well as of law, that will have to he solved in order to determiue the rights of the respective parties.

2. Before discussing any of the controverted, conflicting and somewhat complicated questions of fact, it is proper to say that both parties had several large maps carefully drawn and prepared in such a manner as to materially aid them in presenting the testimony of the respective witnesses in a clear and concise manner. Each party also introduced a large model of the underground workings, by reference to which the Court was ahle to follow the witnesses as they gave their testimony concerning their examination of the several drifts, tunnels, upraises, winzes and levels exposed in the underground workings of the respective claims. The testimony was presented, and the whole case tried, in an intelligent and satisfactory manner. Counsel were fair and courteous to the Court, to the witnesses and to each other. Questions not in real dispute were readily admitted. Each party pursued a similar line of examination by first introducing their surveyors, second, the superintendent, or underground foreman, third, practical and experienced miners, and fourth, one expert on each side. The witnesses were intelligent men aud favorably impressed the Court that they intended to tell the truth and detail the facts as they appeared to them, without any hesitation or equivocation. Both counsel and witnesses demeaned themselves throughout the long and tedious trial in such a manner as to receive the commendation of the Court for their honesty, frankness, ahility and courtesy.

The case was tried with extreme caution so as to cover every possihle phase that might he taken of the numerous questions involved. The result is that many of the questions raised, and much of the testimony taken, become unimportant in the light of the conclusions reached hy the Court.

It is not deemed necessary to enter into any extended statement of the facts. The record is large, perfect and complete. The various links in the chain of evidence are too numerous to warrant any minute attempt to show how they are welded together. The principal contention upon the part of the complainant is that the Wyoming or slate vein, and the Ural or contact vein in their downward course from the surface unite and form a junction and that from the point of junction downward there is hut one lode or vein, and that is a contact vein hetween granite and slate walls.

The coutention of respondent relative to this question is, that there is a middle vein hetween the 300 and 400-foot levels from the Champion shaft which is a separate and wholly independent vein in a different fold of slate from the Wyoming lode, which has its apex within the lines of respondent's claims; that the Wyoming lode or slate vein does not unite with, intersect or touch the contact vein.

From tbe impressions received at the trial, and from a careful review and examination of the testimony as it appears in

the record, my conclusion is that the union of the Wyoming and Ural lodes is clearly established by the weight of the evidence, as contended for by the complainant.

In this connection some general views will be given as to what constitutes a lode or vein. In Book vs. Justice M. Co., 58 Fed. 121, I stated that the statute upon this subject "was intended to be liberal and broad enough to apply to any kind of a lode or vein of quartz or other rock-bearing mineral, in whatever kind or character of formation the mineral might be found. It should be so construed as to protect locators of mining claims who have discovered rock in place bearing any of the precious metals named therein, sufficient to justify the locators in expending their time and money in prospecting and developing the ground located."

The character of the formation in which the veins and lodes are found in the ground in controversy, is entirely different from that which was found to exist in Book vs. Justice, but the quotation therefrom is as applicable to fissure veins as it is to the mineralized zones. In defining lodes and veins the text books and several of the decisions speak of them as fissures in the earth filled with quartz in place carrying gold and silver or other minerals. But true fissure veins and lodes often exist and are continuous without having any filling in certain points or places of mineral matter. A majority of such lodes have, in addition to the clean fissure filling of mineral, a considerable amount of decomposed wall rock, clay, etc.

In slate formations, as was said by Professor Browne, in giving his testimony in this case, it frequently occurs that one of the walls has been subjected to a certain amount of fracture which results in the formation of a number of seams, and in the decomposition of the material included between the seams of unaffected wall rock which miners designate as horses.

To constitute a vein it is not absolutely necessary that there should be a clean fissure filled with mineral, but it may and does exist when filled in places with other matter. The fissure should, of course, have form and be well defined, with hanging and foot walls. Between these walls will be found bodies of quartz, rich and poor, but there is also liable to be found, in many places, short or long distances between the quartz bodies or pay chutes, where no quartz will be found in the fissure between the walls. Yet the vein exists, and is often as well defined as if the same was filled with quartz. The clay, the selvages, slickensides, striation and ribbing of the walls, are frequently as strong evidence of the indication of permanency and continuity as the existence of the quartz itself. Under this definition, the existence and continuity of the slate and contact veins were proven to exist in length and depth throughout the various underground workings by evidence of a convincing character.

During the trial respondent objected to any testimony being given as to the condition or existence of the lodes upon the surface or in the underground workings in the northern portions of the ground, as only the southern portion was really in dispute. I am of opinion that this testimony was admissible, although, in the light of the former judgment and of other features in the case, perhaps unnecessary, as hearing more or less directly upon the question of the union of the two veins in the southern part.

It was shown that the complainant's witnesses in tracing the slate vein downward in the southerly part of the claim, where nearly all of the contests between the parties exist, followed the foot wall of said vein through divers tunnels, inclines, etc., etc., bringing them directly to the contact vein where, as they testify, there was a distinct union of the lodes, the quartz of the slate vein, in some places that were closely examined, entering and joining with the quartz of the contact vein. This condition of affairs is not only found to exist in the southern part, especially in conflict, by the weight of evidence, but is shown by undisputed testimony to have existed at several points in the middle and northern portions of the ground where the ore in the veins has been extracted. The established line of croppings extending through the northern, middle and a portion of the southern part of the ground, running, as they do, in substantially the same general direction and descending into the earth at the different angles specified, shows clearly that if both lodes are continuous they would naturally come together, because you cannot have two separate lodes of ore, or vein matter, going into the earth at the angles and in the manner shown to exist here without their coming together, if both are continuous. Then again there are two branches or separate lodes or veins of ore, one in slate, the other in contact, above the point of junction, and there is but one vein below that point. Without entering into the field of geological science as to the formation of veins and the filling of the cracks or fissures in the earth, it is evident that all the fissures in the ground in controversy were filled, as Professor Janin states, at the same period of time by the same force of nature, whether filled from above, or laterally, or came up from below. All of these facts tend more to less to sustain and strengthen the positive testimony of complainant's witnesses that there is a union of the two lodes. It will be observed that this conclusion is reached independent of any question as to the extent and effect of the former judgment. It is, therefore, unnecessary to discuss the question upon which respondent relied and in regard to which numerous authorities were cited, whether respondent, by its certificate of purchase from the Government, had obtained a subsequent acquired title that could be set up against the judgment. Respondent contends that it should be established by the evidence, to the satisfaction of the Court, that the slate vein unites with the contact, yet it is a union on the strike and not upon the dip. Upon this question there is also a conflict of evidence, the weight of which establishes the fact to be that the line of the union is irregular. It cannot accurately be said that there is a union on the strike only, or a union on the dip only. The line of union varies at different places. The union at the north and south ends of the ground is found at a greater depth than in the middle part. The fact is that the union is partly on the strike and partly on the dip. The weight of the testimony touching this point establishes the fact that the union is more upon the dip than upon the strike.

The views already expressed are conclusive upon the point that complainant, by virtue of its ownership of the slate vein in the Wyoming is entitled to an injunction to prevent respondent from working northerly of a line drawn downward vertically with the southerly end line of the Wyoming claim. If no other portion of the ground was in controversy the decision of the case might be safely rested here without any discussion of the many other questions presented at the trial, because the laws of the United States provide that "where two or more veins unite, the oldest or prior location shall take the vein below the point of union, including all the space of intersection." Revised Statutes U. S., Sec. 2336.

This provision is held not to be in conflict with the provisions of section 2322. Wilhelm vs. Sylvester, 35 Pac. 997; Watervale M. Co. vs. Leach, 33 Pac. Rep. 418.

Complainant would, therefore, take the ground to the full extent stated—that is, between the end line bounding planes of the Wyoming claim extended in their downward course, independent of any rights it may have by virtue of its patent to the Ural lode and surface location.

4. What are the rights of the complainant under the Ural location and patent?

Respondent's counsel claim that no extra lateral rights attached to the contact vein because it crossed the easterly side line of the surface location of the Ural claim before reaching the southerly end line of the location.

This point was not seriously urged, but it was intimated and suggested that the opinion of the Supreme Court in King vs. Amy Silversmith M. Co., 152 U. S. 222, is susceptible of that construction. If that case is not fairly susceptible of such a construction, then it is, of course, conceded that Tyler vs. Sweeney, 54 Fed. 284, and Last Chance M. Co. vs. Tyler M. Co., 61 Fed. 557, are conclusive in favor of complainant's right to all that portion of the Ural lode, the apex of which is within the surface ground of the Ural survey and location. I am of opinion that the decision of the Supreme Court of the United States is not in conflict with the Tyler cases decided in the Court of Appeals for this circuit.

It is a universal rule of construction that the decisions of Courts are to be interpreted with reference to the facts in each particular case. In the Amy case the Court held that the side lines of the claim constituted the end lines of the location. Why? Because "the lines marked as side lines cross the course of the strike of the vein and do not run parallel with it." It would be a contortion of the facts and of the law to construe the principles announced in the Amy case as applicable to a location like the Ural, where the lode, as located by the surface claim, crosses through the northerly end line and runs nearly parallel with the side lines for a distance of about 1400 feet, when it changes its course and crosses the easterly side line of the surface location about 600 feet north of the southerly end line of the location. It cannot, it seems to me, consistently be said that complainant is deprived of any of its extra lateral rights to the 1400 feet, more or less, which is all entirely within the surface lines of the Ural patent, and substantially parallel with the side lines as marked upon the surface ground.

The Statute of the United States is not, in my opinion, susceptible of any such construction, and no decision of any National or State Court has ever gone to that extent. The Supreme Court of the United States in the Amy case simply decided that when a mining claim is located across, instead of along the lode, its side lines must be treated as its end lines and its end lines as its side lines; so that, under the Revised Statutes, Sec. 2322, the dip cannot be followed outside the vertical plane of the original side lines into an adjoining claim.

There is nothing in either of the opinions of the Circuit Court of Appeals in the Tyler cases which is at variance with this principle. On the contrary, this rule is expressly recognized. But it is true that there is an expression in the Tyler case to the effect that the question whether the lode crosses the side line more nearly at right angles than along the course of the side lines should always be considered.

This particular position, which is deemed sound and just, was not discussed in the Amy case, and was not, perhaps, involved in that decision. One illustration will be sufficient to show the justice of the position as stated in the Tyler cases, although that particular question is not here involved:

Let us suppose that a location is made under the Act of 1872, in the form of a parallelogram 1500 feet in length and 600 feet in width; that the lode enters one of the side lines within five feet of one of the end lines of the location; that it then continues upon its strike, nearly parallel with the side lines, until it comes within five feet of the other end line and then changes its course so as to cross the other side line. This lode does not pass through either end line, yet under the rule announced in the Tyler cases the locator would be entitled to 1490 feet lengthwise upon the lode and to follow it for that distance upon its dip vertically downward as expressed in the statute. I am of opinion that in such cases the statute is definite enough, and clear enough, to make the end lines parallel at the point of entrance and of the departure of the lode across the side lines and to draw them crosswise of the general course of the lode within the limits of the surface location, and that this should always be done so as to give to the locator just what the statute evidently intended he should have, instead of depriving him of all extra lateral rights because by some mistake or oversight in marking his lines, or by lack of judgment or knowledge as to where the lode ran, he had failed to get his lines exactly parallel with the lode, and had marked his end lines at a point beyond where the lode was found to exist upon its strike within the surface lines of his location. But, be this as it may, the Amy case does not go to the extent of deciding that if the lode passes through one end line and in its entire course is nearly parallel with the side line which it crosses before reaching the other end line, the locator would be deprived of all his extra lateral rights.

In a majority of cases where mining locations are made in the form of a parallelogram under the Act of 1872, the lode or vein located does not run lengthwise directly parallel with the side lines of the location. The statute is based upon ideal locations of parallelism that seldom, if ever, exist. It is, in fact, almost impossible to make a perfect surface location, the side lines of which would be absolutely parallel with the lode or the end lines precisely at right angles with the strike of the lode, no matter what length of time is taken before marking the surface boundaries of the location. If the locator makes his location crosswise instead of lengthwise of the lode, then the end lines of the location become side lines, and he can only take so much of the lode lengthwise as lies within the surface lines of his location. But, if the lode runs like the contact vein does, through the Ural surface ground, there is no substantial reason that would justify a court in declaring that the locator would not be entitled to any extra lateral rights. No such construction has ever been given to the statute. There is but little, if any, force in the suggestion often made that the locator should postpone the marking of his boundaries until sufficient explorations are made to ascertain the "true course and direction of the vein." The present case furnishes a fair example of the difficulties so often encountered by the miner in his efforts to determine the direction of the vein he has discovered.

The Wyoming vein has been located, and at different times worked upon, during the past forty years, and it is still a disputed and closely contested question as to where the lode actually runs, and, in addition to all of the regular workings of the mine, it has required the expenditure of money, time and labor, in order to enable the witnesses to testify with any degree of certainty the "true course and direction of the vein." Every practical miner knows the difficulty that is often experienced in ascertaining these facts. The truth is that the miner is often compelled by the law to make his lines of location upon the surface ground before such facts can be ascertained. There is a limit to the time he can take before marking the boundaries of his claim. He is required to exercise his best judgment from the developments he has been able to make, and he is, of course, confined to his surface location whether his judgment was right or wrong. The statute should be so construed as to give to the locator what he actually locates—no more and no less. It should be liberally construed in his favor, so as to give him the full benefit of the statute in its true spirit and intent in order to carry out the wise and beneficent policy of the General Government in opening up the mineral lands for exploration and development. When the prospector discovers a vein of ore of sufficient value to justify the expenditure of time, labor and money to open up and develop the same, he is honestly and legally entitled to the fruits of his labor. He is admonished by the law that he will be limited in the length of his lode upon its strike to such portions as is within the surface lines of his location, but he is at the same time assured that he

will not be limited or deprived of his extra lateral rights as to the depth of such lode upon its dip, the apex of which is within the surface lines of his location.

The statute of 1872 gives to locators of mining claims "the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations."

These are their extra lateral rights which should neither be extended nor restricted by the courts. The only limit placed by the statute is that "their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward, as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges."

One general principle should pervade and control the various conditions found to exist in different locations, and its guiding star should be to preserve, in all cases, the essential right given by the statute to follow the lode upon its dip, as well as upon the strike, to so much thereof as its apex is found within the surface lines of the location. If the lode runs more nearly parallel with the end lines than with the side lines as marked on the ground as such, then the end lines of the location must be considered by the courts as the side lines meant by the statute. If the lode runs more nearly parallel with the side lines than the end lines, then the end lines as marked on the ground are considered by the Court as the end lines of the location. In both cases the extra lateral rights are preserved and maintained as defined in the statute.

It may be admitted, as was suggested by counsel in this case, that it would be an herculean task to endeavor to fathom the complications that are liable to arise in the construction of this statute and to provide for their solution upon any defined method of interpretation. One thing, however, is certain, that unless it can be done, then the statute is radically wrong, and the sooner amendments are made thereto, to avoid such difficulties, the better it will be for the mining industry of the country. In fact, it is a question worthy of consideration whether it would not be advisable to have the mining laws amended so as to adopt the Spanish, Mexican and Roman rules and give to the miners a greater width of ground upon the surface, making a square location, and confine the owner of the claim to the ground within the boundary planes of his location in length, width and depth, the same as agricultural land, so as to avoid any further conflict over side and end line propositions that are becoming such fruitful themes of endless dispute and litigation. This is a question, however, that is solely within the province and discretion of Congress.

It will be noticed that the end lines of the Ural are not parallel with each other. The location was made under the laws of 1866, which did not require parallelism of the end lines.

Walrath vs. Champion, post, and authorities there cited.

It was admitted upon the trial by complainant that the northerly end line of the Ural location was the more easterly instead of westerly part thereof, to-wit, the line from C. M. 11, S 56° 10' W., 5 13-100 chains to C. M. Co., No. 4, as shown in the diagram taken from the stipulated map. A line drawn across the Ural location parallel with this northerly end line so as to strike the point where the Ural or contact vein crosses the easterly side line of the Ural location would be the southerly end line of the contact vein, and these end lines extended vertically downward would define the rights which complainant is entitled to under its ownership and patent of the Ural lode.

5. What are the rights of complainant, under and by virtue of its patent to the Ural ground, to the southerly part of the Wyoming or slate vein after it crosses the southerly end line of the Wyoming location? Section 2322 of the Revised Statutes heretofore quoted gave to the owners of the Ural lode and surface location all other veins, lodes and ledges throughout their entire depth, the top and apex of which lies inside of such surface lines extended downward vertically. This portion of the Wyoming lode was not located by complainant. It was the Ural lode for which the patent was obtained, and, under the law of 1866, this was the only lode that was granted; but when the Act of 1872 was passed it was so framed as to apply to all mining locations heretofore made as well as to all others to be thereafter made, and the complainant is the owner of so much of the slate or Wyoming vein as has its apex within the surface of the Ural location. But here we are met with the difficulty of determining from the evidence how far the apex of this vein is shown in the Ural claim after leaving the south end line of the Wyoming surface location. This is the most difficult and doubtful question of fact that is presented to the Court for its determination. The testimony as to the existence of the slate vein to certain points southerly near the mouth of the Wyoming shaft may be said to be fairly established by the evidence. South of that point to the southerly end of the Ural it is not well defined and is not clearly proven. The Court is left in doubt as to the truth. The impression received from an examination of the record might be said to be that the probabilities are in favor of that vein extending through the Ural ground, as claimed by the complainant. But the Court is not prepared to say that the fact of its existence to that extent has been proven to its satisfaction, and this should be clearly shown before the Court would be justified in giving to complainant the right to follow underneath within the surface lines of the New Years and New Years Extension claims belonging to respondent. The respondent has the undoubted right to say to the complainant, "Hands off of any and everything within my surface lines extending vertically downward, until you prove that you are working upon and following a vein which has its apex within your surface claim of which you are the owner!"

Judge Hallett, in Leadville M. Co. vs. Fitzgerald, 4 M. Rep., 385, expresses the true rule upon this subject, as follows: "Within the lines of each location the owner shall be regarded as having full right to all that may be found, until some one can show a clear title to it as a part of some lode or vein having its top or apex in other territory. In other words, we may say that there is a presumption of ownership in every locator as to the territory covered by his location, and within his own lines he shall be regarded as the owner of all valuable deposits until some one else shall show by a preponderance of testimony that such deposits belong to another lode having its top or apex elsewhere." See also Doe vs. Waterloo, 54 Fed. 937; Duggan vs. Davey, 26 N. W. 892.

The facts do not show by preponderance of evidence that the slate vein extends any further south than the southerly end line plane of the Ural drawn as before stated it should be, and as the slate vein is not clearly shown to pass that line going south I am of opinion that complainant is not entitled to any further or other rights than has already been given to it by virtue of its patent to the Ural or contact lode. The same result would be reached if the Court should accept the doctrine announced in Patterson vs. Hitchcock, 3 Col. 533, and followed in Armstrong vs. Lower, 6 Col. 399, that, "if the lode located terminates at any point within the location, or departs at any point from the side lines, the location beyond such point is defeasible if not void."

6. With reference to complainant's rights there is one novel proposition, seriously and earnestly advanced by complainant's counsel, that demands consideration. It is substantially to the effect that where the patent conveys a lode and independently and clearly marks in out, as the Land Office has a right to do and did do in this case, then no collateral attack can be made to the patent so as to show that the lode is in another place from that marked out in the patent, and it was argued that there was a distinction, which should be observed and followed by the Court, between a patent where there is no lode distinctly granted by a specific definition, where the Court must naturally enquire as to its existence and extent in order to determine the rights of the parties, and a case where a patent recites the direction and course of the lode. In the latter case it is claimed that while the Government of the United States might enquire as to its truth, that no collateral attack could be made upon it by the owners of other mining locations; that the Court is absolutely bound to proceed and act upon the theory that the Land Office ascertained the facts before it granted the patent; that the definition of the Ural lode is as complete and perfect to all intents and purposes as it is to the surface boundary lines of the ground itself within which it is included, and upon these grounds complainant denies the right of respondent to show that the Ural or contact vein does not run along the dotted line of the patent, as shown in the diagram, clear through the Ural claim, from end to end of the location and survey. The reply to this is that respondent is not assailing the patent in any manner whatever. It does not deny its validity. It admits that complainant has the title to the contact vein and to every other lode or vein within the limits of the surface location of the Ural claim. It denies and has the right to deny that any portion of the Ural lode situate southerly from the point where it crosses the easterly side line of the Ural location has its apex within the Ural claim. The answer heretofore given that complainant must prove that the vein it claims within the surface lines of another mining company has its apex within the lines of its own claim is directly applicable to this contention. This Court cannot presume that the Land Office determined the course of the lode. The marking of an ideal line across the survey and diagram did not have the effect of putting a lode into the ground if there was no vein there. The respondent has the right to show what the facts are.

Mr. Justice Miller, in answering a somewhat similar contention, in his instructions to the jury, Stevens vs. Williams, 1 McCrary, 480, said: "The plaintiff has asked certain instructions which I have refused, * * * and I regret that they should have been introduced. * * * I am asked by him to state that the patent which he has received from the United States for the iron mine is conclusive that the sheet of mineral matter in question is a vein within the meaning of the statute. I decline to give this instruction. Certainly, outside of the vertical projection of the side lines of the plaintiff's patented ground, if the defendants can show that the mineral matter which is the subject of this controversy is not a vein, they have the right to show it. Outside of the side lines of the plaintiff projected perpendicularly downward defendants have the right, if they can, to show that the vein, or thing which is called a vein, is not a vein."

7. One more question and the case is disposed of: It is claimed by respondent that under the form of the pleadings in this case the complainant is not entitled to an accounting; that this action is really an ancillary action at law, and that complainant should have divided its case and gone upon the law side for its damages and upon the equity side for its injunction. Such is the common, and, as I think, the better practice, and more in accordance with the rules of this Court. But a vast number of authorities were cited by counsel, the weight of which seems to sustain the right of complainant under the pleadings to an accounting as well as to an injunction.

Let a decree be drawn in conformity with this opinion for an injunction, and for an accounting.

A Sophist.

Mr. Ohleyer, in the Marysville *Appeal*, characterizes the hydraulic section of Nevada county as a "worked out mining section." If that be a true characterization, says the *Herald*, there is little need of fear of mining debris from Nevada county. Some of the best hydraulic mines in the county would require many thousands of dollars to equip them for work. After so long an enforced idleness flumes have decayed, pipes have rotted, and new machinery of all kinds have to be bought. If the section were known to be worked out, no one would go to the expense of starting these mines, and, if they did, they would not long work them if there were no returns.

But we know these mines would start up again and give new life to this country if restraining dams could be built. Mr. Ohleyer knows this also; but he has allowed his zeal to get the better of his judgement, and has made a statement that is either false or it shows the valley people to be unnecessarily alarmed at the prospect of a dams being built on the Yuba.

If the section is worked out there will be no more hydraulic mining, and the dam would be of benefit to the valley only. If the mines are not worked out, the dam would restrain the debris from them when they work again, as well as that which is already in the river, thus benefiting both the miner and the farmer. This is a plain proposition.

The writer, however, shows his real position when he says: "There must be no more such use made of the public streams as heretofore, dams or no dams." If this were a "worked out section" there would be no desire to use the dams as heretofore. The truth is that the well known fact that there are millions of dollars yet in the hydraulic mines of this county makes it certain that they will be worked some time. The Government can not afford to do without this gold. If it is willing to help build dams to hold the debris, why should anyone object? The Government will be benefited as much as any individual. A resort to sophistry will not make out a case for you, Mr. Ohleyer.

Unemployed Labor.

A meeting was held at Dillman's Hall last night of about 200 ex-employes of the railroad shops. They decided to form themselves into a joint stock company and by capitalizing their labor, to be the better enabled to secure remunerative employment.

S. E. May, Joseph Ploner, J. J. Harrell, C. E. Adams and H. Pollack were appointed an executive committee to confer with the owners of idle hydraulic and other mines in Nevada county with a view of going to work upon those mines.

Another meeting will be held in the same place tomorrow evening.

The above is from the Sacramento *Bee*. What in the world the unemployed are going to do here among the hydraulic mines is more than we know, as there is not one hydraulic mine running, and as for the quartz mines around here, there are idle miners enough to run a dozen more mines.—Grass Valley Telegraph.

A Colorado Gold Mine.

NO. III.

Fig. 17 is from a photograph of the inclined shaft, whose slant is 25 degrees from the vertical. Fig. 18 shows its plan and vertical section.

The timber is cut 12x12 inches square set.
Center piece 6x12 inches.
Studdles 12x12 inches.

Sets are 5 feet from center to center, and lagged with 3-inch plank.

Each set is drawn together with bolts, drawn to

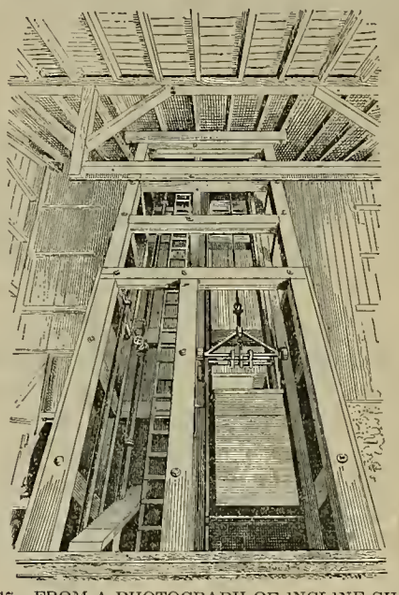


FIG. 17. FROM A PHOTOGRAPH OF INCLINE SHAFT.

place, lined and wedged up. The bolts are then withdrawn from the third lowest set or reversed.

The number of miners at present at the Standley Consolidated, which has been described and illustrated in the article of which this is the third and last installment, is 75; surface workmen, 10; 1 fore-

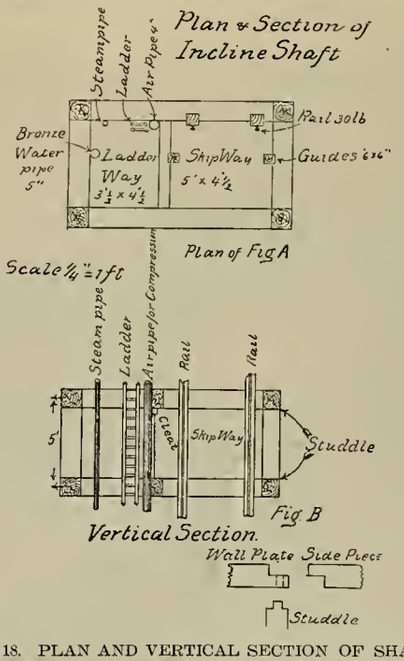


FIG. 18. PLAN AND VERTICAL SECTION OF SHAFT.

man and 1 shift boss; length of working shift, 9 hours; number of shifts, 2; wages per shift, $2.50 to $3; cost of sinking shafting is $20 per foot; drifting on levels, air drill, $3 per foot; drifting is by contract, stoping by day's pay; cost of timber stulls, not less than 12 inches tips and 16 feet long, is $1; of lagging 6-inch tips and 16 feet long, 20 cents; lumber, $15; fuel coal, $3 per ton; iron, 3 cents per foot; steel, 9 cents; Atlas powder, 13 cents; caudles, $4 per box; cost of mining a ton of ore, $2.

A. Walrath et al. vs. Champion Mining Co.

Decision in the Circuit Court of the United States, Ninth Circuit—Hon. Thos. P. Hawley, Judge.

The following decision was read by Judge Beatty in this city on the 13th inst. It is published in full, together with a diagram of the disputed ground:

This action is of the same character as the Con. Wyoming-Champion, just decided, and may be said to be a companion case, as it involves the title to a small segment of mining ground of the "contact" vein situate farther south.

The Providence mine was located in July, 1857, in conformity with the local rules and regulations of the miners in the mining district where the claim is located. On the 28th of April, 1871, a patent was obtained from the Government of the United States for 3100 linear feet of the Providence lode and for certain surface ground of irregular shape and form. This patent was issued under the provisions of the Act of Congress of July, 1866, and the grant was "restricted to one vein, ledge or lode," and to the surface ground particularly described by metes and bounds.

Complainant derives his title to the Providence lode under said patent, as a cotenant.

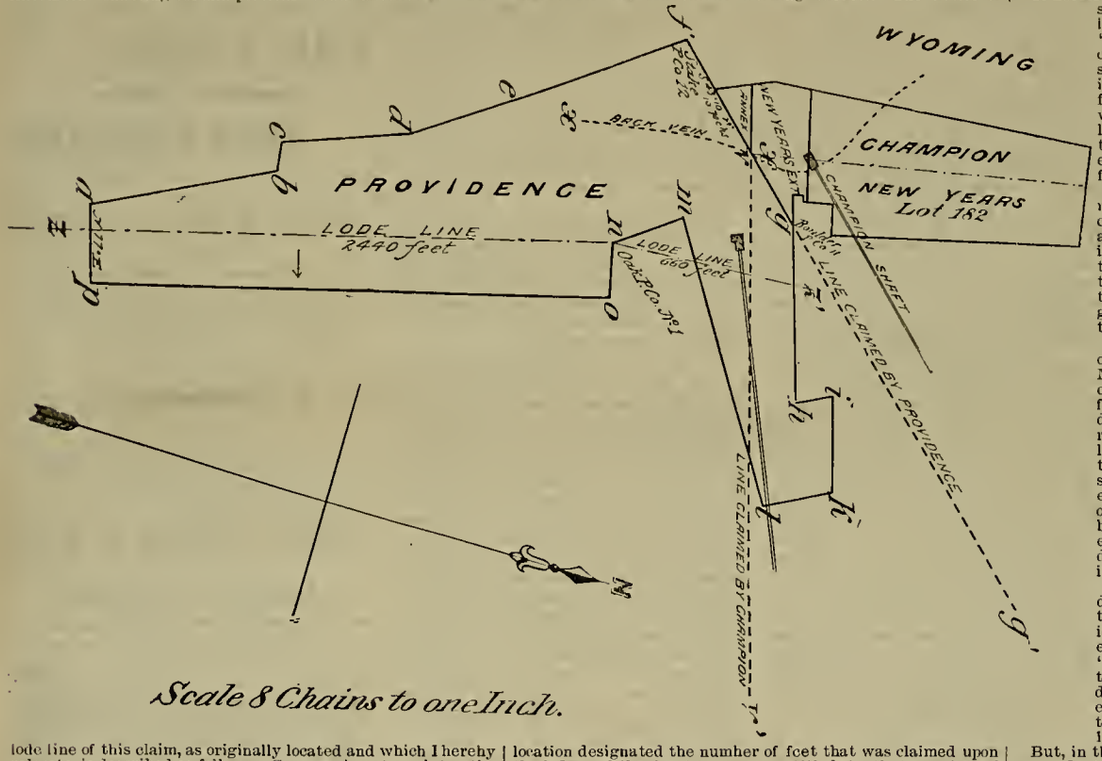
The respondent is the owner of the mining claims and ground known as the "New Years" and "New Years Extension." Its right to these claims was acquired subsequent to the Act of Congress of 1872, and is evidenced by a receipt and certificate of purchase from the United States Land Office, which is the equivalent of a patent. The original location of the New Years Extension on its southeasterly side overlapped upon the surface of the Providence mine, in the form of a triangle.

In 1884, the owners of the Providence objected to this overlap upon their patented ground, and the result of this objection was that the respondent caused a relocation to be made, by its superintendent, abandoning such portions of the lode and surface ground as were within the patented surface lines of the Providence. The notice of location of the New Years Extension—omitting certain portions—reads as follows: "The Providence lode as patented extends northerly about thirty feet across and beyond the line g, h, and about —— feet southerly beyond the south line a, p, of the surface location. No portion of the surface ground is in dispute. There is no controversy with reference to the Providence lode. The only controversy between the parties is in relation to the "contact" or "back" vein. What portion of this vein in its downward course is complainant entitled to? Which line is the northerly end line of the Providence ground through which the vertical plane is to be drawn downward with reference to the contact vein?

Complainant claims that the line f, g, on the diagram is the northerly line of the Providence with reference to this lode and that this line should be extended to g', and so on indefinitely downward. Respondent claims that the line should be drawn from the point where the lode crosses the southerly line of the New Years Extension, or unnex covering the same ground from r to r', marked on the diagram as the "line claimed by Champion."

The case was argued ingeniously, with much zeal, force and ability upon both sides, and numerous questions of both law and fact were earnestly pressed upon the attention of the Court in favor of the respective contentions. Many of the points thus presented were—as in the Con. Wyoming case—novel and new, and all of them were exceedingly interesting and have received a careful consideration. I shall content myself, however, by stating what is believed to be the proper construction of the Statutes of the United States and announce my conclusion upon the questions involved without attempting to discuss all the legal points advanced by counsel.

As there is no dispute between the parties as to the right of complainant to the Providence lode, it is unnecessary to discuss that question except so far as it may tend to illustrate or explain the principle that is to be applied to his right to the contact vein. The Providence lode was located, as before stated, prior to the act of 1866, under the rules, regulations and customs of the miners in the district where the mining claim is situated. The locators were only required to designate the lode in their notice of location. The lode was the principal thing. The surface ground was a mere incident thereto for the convenient working thereof. The notice of



lode line of this claim, as originally located and which I hereby relocate, is described as follows: Commencing at a point on the northerly bank of Deer creek, which point is 80 feet S. 11 deg. 45 minutes east of the mouth of the New Years tunnel, and running thence along the line of the lode towards the N. E. corner of the Providence mill, about S. 46 deg. 15 minutes east, 300 feet, more or less, to a point and stake on the northerly line of the Providence mine patented, designated as mineral lot No. 40 for the south end of said lode line. * * * And whereas, part of this claim, as originally described and as hereby relocated, conflicts with the rights granted by the letters patent of said Providence mine. * * * Now, therefore, so much of this claim, both for lode and surface ground, as originally designated, conflicted or now conflicts with any portion of the surface or lode claims or rights granted by said patent is and are hereby abandoned. Which portion of this claim so abandoned is described as follows: All that portion of the above described New Years Extension claim for surface and lode, which lies south of the northern boundary of said Providence mine which runs north 43 deg. 10 min. east, across the southeastern corner of this claim."

Numerous maps, diagrams and models were offered by the respective parties. The above diagram is deemed sufficient to illustrate and explain the contention of the respective parties:

The lines a, b, c, d, e, f, g, h, i, k, l, m, n, o, p, represent the lines described in the patent of the Providence. The lode line from z to z' running in a northerly and southerly direction represents the Providence lode described in the patent. This lode is in granite and is called the "granite lode:" its dip is to the east. The lode deliniated on the diagram and marked x x' is a separate and independent lode from the granite, and is called by complainant a "back vein," and by respondent the "contact" vein, between slate and granite walls. This lode is the same as was designated in the Con. Wyoming vs. Champion, as the Ural or "contact" vein. It will be noticed that in its course upon its strike it comes into the New Years claim across the Ural side line—marked Wyoming in the diagram—and passes through the New Years in a southerly direction to the northerly line of the New Years Extension, when it changes its direction to a southerly course and extends through the New Years Extension and across the line f, g, of the Providence surface line and extends through the Providence ground to the point x, as delineated on the diagram. Its direction beyond that point has not been ascertained and is entirely problematical and, as I think, is wholly immaterial. If it continues in the same direction it would cross the line of the Providence between d and f near the point e; but for aught that appears in the evidence it may extend through the Providence ground and cross the line a, p. Its dip—like the Providence—is to the east.

location designated the number of feet that was claimed upon the lode, and the locators were entitled to that number of feet, if allowed by local rules, in whatever direction the lode run, and to all its dips, spurs, angles and variations. The subsequent acts of Congress did not interfere with these rights, but were in all respects confirmatory thereof. The Eureka case, 4 Saw. 323; Wilhelm vs. Sylvester, 35 Pac. Rep. 997.

The act of 1866 provided a method whereby the owners of mining claims, located prior to the passage of the act, who had complied with these local customs, rules and regulations, might, upon certain conditions, receive a patent therefor from the Government of the United States. Parties applying for patents were required, among other things, to "file in the local Land Office a diagram of the same so extended laterally or otherwise as to conform to the local laws, customs and rules of miners, and to enter such tract and receive a patent therefor," etc., etc. Under the act of 1866, parallelism of end lines was not required, but by the act of 1872 parallelism of end lines is made essential, a survey of the surface ground must be made before it can be patented, and the surface lines of such survey should be marked upon the ground whether patented under the law of 1866 or of 1872. The intent of both acts, in this respect, is substantially to the effect that the mining locations made thereunder should be along the lode lengthwise, and the surface boundaries should be marked upon the claim. It was not intended by either act that the locator would have any right to follow the lode upon its strike beyond the surface lines of his location. The term "location" as used in both acts refers to the surface ground as well as to the vein or lode. The lode claim, whatever its nature, character or extent, is to be limited to the survey of the surface location, and the title to the lode upon its strike is not given to any portion thereof which departs beyond the surface lines of the location.

In Mining Co. vs. Tarhot, 98 U. S. 463, familiarly called the Flagstaff case, the Supreme Court of the United States declared that under the act of 1866, as well as under the act of 1872, the location of a mining claim upon a lode or vein should be made along the same lengthwise of the course of its apex, at or near the surface, and in the course of its opinion said: "The Act of 1872 is more explicit in its terms; but the intent is undoubtedly the same, as it respects end lines and side lines and the right to follow the dip outside of the latter. We think that the intent of both statutes is that mining locations on lodes or veins shall be made thereon lengthwise, in the general direction of such veins or lodes on the surface of the earth where they are discoverable, and that the end lines are to cross the lode and extend perpendicularly downwards, and to be continued in their own direction either way horizontally; and that the right to follow the dip outside of the side lines is based on the hypothesis that the direction of these lines correspond substantially with the course of the lode or vein at its apex on or near the surface." See also Iron M. Co. vs. Elgin M. Co., 118 U. S. 248; The Eureka case, 4 Saw. 323; McCormick vs. Varnes, 2 Utah 355; 9 Mor. M. R. 505.

The patent to the Providence mine was confined to the Providence lode and to the surface ground as surveyed, and marked on the diagram filed in the Land Office. It granted no right to the owners of the Providence to the "back" vein. It was a grant to the Providence lode only and in express terms excluded all others. The effect of the Act of 1872 was to grant to the owners of the Providence surface location all other "veins, lodes and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically in whatever course or direction they might run." In Wilhelm vs. Sylvester, 35 Pac. Rep. 997, the Supreme Court of California in discussing this question, after quoting from Section 2322 of the Revised Statutes, said: "This language is clear and explicit, and, in designating the property rights of locators, is in no wise ambiguous or uncertain. It expressly, and in language which needs no construction, grants to such locators every ledge or lode the top or apex of which lies within the surface lines of the location; that is, such part of the ledge as lies within such lines. And there is no limitation or exception of any such ledge on account of the direction it may run. It may be parallel with the originally discovered ledge, or may approach it at right angles, or at an obtuse angle, or at an acute angle; it may intersect it or not, and still it may be clearly within the language of the said section."

The Act of 1872, in granting all other veins that were within the surface lines of previous locations, did not create any new lines for such veins, nor invest the Court with any authority to make new end lines for such other veins. And it is apparent from an examination of the statute, that the Court has no power to make a new location for every vein that may be found within the surface lines of the location and thereby enlarge the rights of the original locators.

When the end lines of a mining location are once fixed, they bound the extra lateral rights to all the lodes that are thereafter found within the surface lines of the location.

It necessarily follows that the end lines of the Providence survey must be considered by the Court as the end lines of any and all other lodes or veins which lie "inside of such surface lines." Otherwise endless confusion would arise in the construction of the statute. End lines would have to be constructed in different directions if the separate lodes or veins found within the surface lines did not run parallel with each other, and the result would be that these lines extended might give to the owners of the claims a greater length along the lode as it extended downward than they had upon the surface.

If the same end lines which bind the extra lateral rights of the Providence surface survey apply to the contact vein and to all other veins, if any are hereafter found, then no such difficulty can arise. This is the rule that applies to all locations made after the Act of 1872, and it ought not to be presumed that Congress—by its grant to prior locators—intended to give greater rights to them than were given and granted to subsequent locators under the same Act.

It is settled by the decision of the Supreme Court of the United States in Iron S. M. Co. vs. Elgin M. Co. that the same end lines bound all extra lateral rights as to all veins or lodes within the surface boundaries of the claim. Justice Field, in delivering the opinion of the Court, speaking of the rights of locators of mining ground to follow the lode in its depth, said: "It often happens that the top or apex of more than one vein lies within such surface lines, and the veins may have different courses and dips, yet his right to follow them outside of the side lines of the location must be bound by planes drawn vertically through the same end lines. The planes of the end lines cannot be drawn at right angle to the courses of all the veins if they are not identical."

In the present case the end lines of the Providence—a, p, and g, h—are conceded to be substantially parallel with each other, and that the Providence lode in its course lengthwise passes these end lines. Complainant's contention would take the "back" or "contact" vein outside of the plane of the northerly end line of the Providence drawn downward vertically and give to him extra lateral rights not granted by the patent nor given to him by the granting provisions of the Act of 1872.

But, in this connection, it is argued by complainant that respondent is estopped from asserting any claim to any vein or lode lying southerly from the line f, g, because (1) in its relocation of the New Years Extension claim it recognized and designated that line as the "northerly end line of the Providence line," and expressly abandoned all that portion of the original New Years Extension claim "for surface and lode which lies south of the northern boundary line of said Providence mine, which runs north 43 deg. 10 min. east, across the southeastern corner of this claim;" (2) Testimony was offered and admitted against the objection of respondent, tending to show a further estoppel which was to the effect that before the Champion shaft was started the plans therefor were submitted, by the then superintendent, to the Board of Directors of respondent and approved by it, and that the shaft was sunk, in pursuance of such plans, parallel with the line f, g, extended in the direction of g', and that the superintendent had conversations, about that time, with complainant and his brother—a co-owner in the Providence—and stated that he would never interfere with that line and would never cross it, and that this line was practically agreed upon by them at that time as the boundary line between the two claims.

This testimony, giving it full scope and effect, is not sufficient to create an equitable estoppel.

The corporation is not bound by such declarations of its superintendent made without the scope of his agency or authority from the corporation. If respondent was given the line for which it contends it would take that portion of the lode which it expressly abandoned by its relocation. The abandonment, which is binding upon it, was to any and all lodes within the surface boundaries of the Providence location and survey; but this abandonment or agreement—or whatever it may be called—did not give to the Providence any greater rights than it previously had. The acquiescence and agreement between the parties amounted to nothing more than a recognition of both parties that the line f, g, was the boundary line between the two companies.

There is nothing in the facts of this case which gives to complainant any right to extend that line—as a boundary line—any further than to point g, at which point it comes to the line g, h, which, as before stated, is the northerly end line of the Providence surface location, and beyond which, in a vertical line drawn downward, the complainant had no right to any part or portion of the "back" vein either by virtue of the Providence location, patent, Act of 1872, or any agreement or estoppel between the parties. Let a decree be drawn designating the boundary plane fixing the rights of the parties in conformity with the views expressed in this opinion, for a perpetual injunction, and for an accounting, if so desired; each party to pay their own costs.

The Origin of the Gold of Quartz Veins.

By Prof. J. Logan Lobley, F. F. S.

Not more than thirty years ago the hypothesis of the igneous origin of the "vein stuff" of mineral veins was stoutly advocated by eminent geologists, and yet to-day the theory, so far as regards the carthy minerals of a vein, may almost be considered to be obsolete. The gold of quartz veins, however, is still held by many to have been introduced into the interstices of the quartz by igneous action. There are others agaiu who, while admitting the aqueous introduction of the gold into the veins, still maintain the theory of its earlier igneous uprise from the deep interior into the massive rocks containing the veins. Recent observations and discoveries by geologists and chemists have now, however, laid the foundations for a theory which attributes the gold of quartz veins not only to an aqueous conveyance to the veins, but to au aqueous origin also, since it makes the waters of the sea the source of the gold.

The opinion of Sir Roderick Murchison, that auriferous veins were confined to Palæozoic rocks or the neighborhood of igneous eruptions, has been contradicted by the finding of gold-bearing quartz veins in California traversing Cretaceous and Tertiary strata; even in localities where there are no indications of igneous action having taken place either in Cretaceous or Tertiary times. This goes far to displace the igneous hypothesis; but there is a fact of very great significance iu this controversy which seems to have been strangely overlooked by the disputants. It is the remarkable absence of gold from volcanic products.

If gold was originally derived from plutonic sources, it ought to be found among volcanic products which come from the same deep-seated sources, and only differ from plutonic rocks in having been solidified uuder different conditions. But, although a most widely distributed metal, gold is almost if not quite unkuown as a volcanic product. That quartz veins aud metalliferous lodes containing the precious metal occur in some regions that have been subjected to volcauic action is true, but other regions of a still more pronounced volcanic character are non-auriferous. It is, too, a most importaut consideration that in gold-producing volcanic regions, the gold is rather in the veins traversing the non-volcanic rocks than in the volcanic rocks themselves. It may also be asked, why is not gold a usual product of volcanic regions? So far, indeed, from volcanic districts being usually auriferous, the reverse is the case, for the usual nou-association of gold with volcanic products is a conspicuous fact, and a much more remarkable and telling oue than its mere statement suggests, both from the very wide distribution of gold and the richness of volcanic products in mineral species, metallic as well as non-metallic.

The great volcanic island of Iceland is devoid of gold, as are also the eminently volcanic areas of Sicily, the Lipari and Pouza islands, as well as the several extinct volcanic districts of Italy. The great volcanic district of Auvergue in central France, and the volcanic districts of the Eifel and Siebengeberge, in Germany, are all non-auriferous; but we seek for gold with success in the bed of the Rhine that brings detritus from the non-volcanic Alps, and find it *in situ* in the non-volcanic rocks of Schemnitz, in Hungary, and the Abrudbanya, in Transylvania, while the volcanic trachytes of these districts are devoid of the precious metal.

Nor is the absence of gold from volcanic products only uoticeable in the European part of the earth's surface. In the volcanic islands of the Pacific gold is also conspicuous by its absence, but non-volcanic New South Wales and Queensland are richly auriferous; and although there is gold in the volcanic North Island of New Zealand, there is very much more in the nou-volcanic South Island, while that in the North Island is not in volcanic rocks. The gold fields of India are not amongst the volcanic rocks of the Deccan, but on the non-volcanic plains of Mysore, and the great auriferous regions of northern Asia are in the Urals, and central and eastern parts of Siberia, all non-volcanic. Western Africa, too, distant from the volcanic Cameroons, gives to the Gold Coast its auriferous sands, but from the altogether volcanic Canary islands gold is not obtained.

But, eertainly the most striking example of the non-auriferous character of volcanic products has yet to be mentioned. The Vesuvian arca of about 100 square miles has produced by far the greatest variety of minerals of any arca of even a hundred times its extent. These include a number of metallic minerals; but neither gold nor any salt of gold, or auriferous compound or alloy of any kind, has ever been noted, notwithstanding the diligent examination to which Vesuvian products have been subjected by competent observers for a long period of time.

The occurrence of rich aurifcrous detritus beneath masses of lava, both iu California and in Victoria, has no bearing on the question, since these detrital deposits are not derived from the place where they uow are, but from hills at a considerable distance, in which were the auriferous veins long before the outbust of the lavas now covering the beds that have resulted from the erosion of the rocks of which those elevations were formed. Indeed, in view of the wide dissemination of gold in the rocks of every continent, and its absence from so many widely separated volcanic regions, it would seem to be but a fair and reasonable conclusion that the gold of the surface rocks has uot been derived from volcauic sources, and therefore not from the sources of plutonic rocks, and consequently not by igneous action.

The aqueous hypothesis of the occurrence of metallic gold in quartz veins is based on the following considerations: Gold is one of the most insoluble aud unchanging of minerals, whether metallic or non-metallic. It is not oxidized by either air or water, and is not attacked by any of the ordinary acids, much less is it dissolved by water either cold or hot. But it chemically unites with some, though very few, elements, and so forms auric compounds, and these compounds are soluble to a greater or less exteut in water, and it is itself soluble in sclenic acid and also in aqua-regia or nitro-hydrochloric acid under certain conditions. Chlorine is one of the few elements with which gold forms a chemical compound, and this salt of gold, the auric chloride, or the terchloride of gold, is readily dissolved by water at ordinary temperatures. With sulphur a sulphide of gold is formed that is also a soluble salt, though not nearly so much so as is the chloride.

The long-coutinued, unsuccessful efforts to crystallize carbon and alumina, though minute diamonds and rubies were eventually produced, sufficiently show that in Nature's laboratory conditions obtain that can only with the greatest difficulty be produced artificially. It seems probable that, under natural conditions of heat and pressure, gold will unite with silica, forming a silicate of gold slightly soluble iu hot water. Thus the same conditions that favor the solution of silica itself, which, as is well knowu, is slightly soluble in hot water, and the deposition of it iu cavities or fissures would likewise be favorable to the formation of a silicate of gold in siliceous auriferous rocks, and the subsequent solution of the compound and its transportation also from the massive rock into any cavity or fissure. There would thus be an infilling of fissures with silica, together with an admixture of silicate of gold, not to mention other minerals. Time alone would then be required to effect the complete separation of the gold from the silica with which it was united, and leave it as free metallic gold iu the diversified forms and quantities in which it is now found in quartz veins. In support of this view Bischoff, Dr. Sterry Hunt and Prof. Newbery, all high authorities, have expressed the opinion that gold has probably been introduced into veins in the form of silicate.

The problem of the origin of gold, then, seems to be reduced to accounting for its occurrence in sufficient quantity in ordinary marine sedimentary rocks. As all of the materials of these rocks were derived directly from the seas of the globe, it will be necessary to ask, in the first place, could the sea water contain and deposit the gold now imbedded and disseminated iu the rocks of the globe? The question can now be answered very distinctly in the affirmative.

Since the sea is the great receptacle for all solutions, it was safe to conclude that it contained the soluble salts of gold, but the fact is not now a matter of mere deduction, but of actual knowledge. Sonstadt found, from careful experiments on the sea water of Ramsey bay, Isle of Man, that sea water contains a little under a grain of gold per ton. Estimating the whole of the gold production of the world to the preseut time at £8,500,000,000 sterling, and taking the weignt of the sea water of the globe at 560,000,000,000,000,000 tons, as estimated by Prof. Wurtz, of New York, we find that the present seas of the globe contain upward of 5,000,000 times as much gold as has ever been extracted from the rocks; and consequently we must conclude that the seas of the globe in the past have been fully able to stock its mineral deposits with all the gold they contain.

We now arrive at the next stage of the inquiry, which is, how can the gold be separated from its marine solution and be deposited along with the materials of the sands, the shales, the clays and the limestones that constitute the sedimentary rocks?

By the accidental dropping of a picce of cork into a solution of chloride of gold, Mr. Richard Daintree, of the Geological Survey of Victoria, discovered that organic matter causes the decomposition of an auric chloride solution, and the consequent precipitation of metallic gold. During the deposition of the materials of the sedimentary rocks at the bottoms of the Palæozoic and Secondary and Tertiary seas, much organic matter undoubtedly existed on the sea bottom. Some strata are so crowded with the fossilized enduring parts of animal organisms, that they are now actually named, in geological nomenclature, "bone beds" and "shell beds," and we have abundant evidence of the existence, also, through the geological periods, of a great amount of algæ or seaweed.

Assuming, then, that the waters of the seas of the past contained gold by the solutiou of its salts as our present sea water does, the conditions would be quite favorable for the deposition of gold contemporaneously with the accumulation of the ocean bed. The amount of gold thus deposited would, however, necessarily be so exceedingly small in proportiou to the mass in which it was included, as to be almost infinitesimal, and too little, therefore, to be detected in the resulting rocks, unless concentrated by separation from the general mass and accumulation in aggregations conjointly with other metallic mineral matter.

Consequent upon the important discovery of Daintree, Prof. C. Wilkinson carried out a long series of experiments, from which it was evident that gold precipitated by organic matter aggregated around metallic nuclei, aud that besides gold itself, the sulphides of the metals, as pyrites and galeua, were especially attractive. This is in entire accordance with the well-known fact of the association of gold with the metallic sulphides, and particularly with pyrites. When in association with pyrites and other metallic minerals, whether au association of adhesion merely or as an alloy, the gold would remain so associated until induced by the occurrence of new aud favoring conditions to sever itself from its metallic associates, and chemically combine with an element or a compound for which under the conditions to which it was exposed it had affinity, and which body I imagine would be supplied by silica.

From these considerations it seems probable that gold was originally dissolved in the waters of the ocean, from which it was deposited as the result of the decomposition of soluble salts of gold by the action of organic matter, and that it was then eliminated from sedimentary rocks by segregation to other metallic matter with which it remained associated until thermal conditions (caused by deep-seated position or not far distant igneous action) induced a chemical reaction, and likewise heated sufficiently the subterranean water of the rocks to make it an effective solvent of the auriferous compound. So the gold of the massive rocks was carried with silica by percolatiug water into the accumulating "vein stuff" of rock fissures, where, on cooler conditions supervening, the auriferous eompound was deposited in a solid condition, and the gold itself subsequently separated, by the segregation of the silica to the vein quartz, and left disseminated through the vein stuff as metallic gold in the forms in which it is now found.

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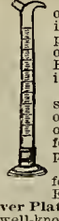

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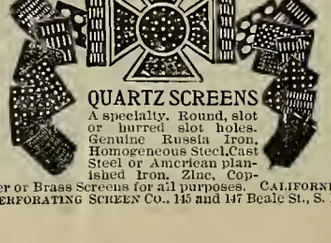

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A Vast Copper Mine.

The magnitude and extensive scale upon which copper mining is carried on in the upper peninsula of Michigan is a matter of astonishment and interest, even to those who are residing in the district, and to the stranger who tarries a few days or weeks it is beyond comprehension, for the reason that he cannot realize how vast in depth and extent are the shafts and levels in so great a mine as the Calumet & Hecla—the famous copper mine of the world.

The conglomerate vein which is being mined by the Calumet & Hecla is made up of water-worn pebbles, boulders and bunches of sand rock, intermixed with which, like a cement as it were, is the pure native copper. No copper ore is found in this district, no matter how microscopically minute the particles of copper may be disseminated. Between the matrix of rock it is pure virgin copper, which, to be made available for the market, has simply to be crushed out and washed out with water to prepare it for the fire that smelts it.

The Calumet & Hecla has a length of two miles of vein running nearly north and south. The veins dip to the west at an angle of about 38 degrees, and therefore the shafts are sunk in that direction and angle. In nearly thirty years of mining the company has attained a depth of nearly 5000 feet, from which the heavily laden skips or cars, drawn by the finest steel wire cable that money can buy, are hoisted to the surface at a speed equal to the locomotives running on a standard railway. The operation of mining has been to sink one level or lift 100 feet deep, then to drift along the vein to the next shaft and then sink again to the next level, and then to break the vein rock down from above, fill it in tramcars which are dumped into the skips that take them to the surface, and this has been going on for thirty years. In the earlier days of the mine, however, very much slower progress was made, for the miner had to strike the sharpened steel drill by blows of a sledgehammer in his hands. The blasting was done by common black gunpowder in coarser grains than those used for firearms, and a horse attached to a whim did the hoisting of the rock to the surface.

To-day a powerful steam engine compresses the atmosphere which is conducted underground in iron pipes. The compressed air is the motive power that works mechanical drills that are pointed with diamonds, and a hole is drilled in a few hours that would have taken several days with the hand drills. Instead of black powder, the drill holes are charged with dynamite, so extremely sudden and terrific in its action that no tamping in is needed to keep it from blowing out, the atmosphere being sufficient to cause it to do execution in the hardest of rock. What was considered nearly a year's work thirty years ago is now done in a month.

There have been made upon the mine location nearly twenty miles of streets between the residences of the employes, but if the drifts and shafts that have been bored out of the solid rock were put in one continuous level, it would be over 100 miles long. The amount of vein rock coming out to the surface is over 400 tons per day. For the accommodation of its employes, 698 dwelling houses were built, and lots leased upon which the employes have built 182 houses. Of mine buildings, such as shaft, rock, engine, carpenter, blacksmith and machine shops, there are over fifty. Of steam engines there are nearly 100, ranging from 4700-horse power to only a few horse power.

Foreign governments have sent representatives to visit and study the plans and methods of operating the large copper mine. The total boiler capacity required is 22,500-horse power. It consumes an enormous quantity of coal, and during the recent strike of the coal miners the mine would have been obliged to close down but for the liberal policy under which the affairs of this company are managed. There was enough coal in its enormous coal shed at Lake Linden to last nearly six months, and it was also successful in getting twenty or more cargoes as soon as navigation opened. All departments of the mine are up to date, and all modern mining appliances that have proved practical are in use. Its machine shop is built of stone, the dimensions being 225x250 feet.

There are forty steam engines doing service at the mine alone, and a dozen more at the stamp mills at Lake Linden. The mine has its rock carried to its stamp mills at Lake Linden, five miles away, by a railroad of its own. The locomotives used are nearly 100 tons in weight, and pull up the hill from Lake Linden, where there is a grade of 700 feet from mill to mine, over 130 empty rock cars. All employes are protected by an accident and sick fund, which pays them at the rate of $25 per month when disabled, and $500 to the heirs of those killed while in the discharge of duty.

The Big Bassick Mine.

The recent incorporation of the Bassick Gold Mining and Milling Co., of Utah and Colorado, which now owns that property, recalls the early days of that famous gold-producer.

The mine was discovered in 1877 by a wandering sailor who had turned prospector. His name was E. C. Bassick. He is now living in Bridgeport, Conn., off a competence he settled on his wife in the palmy days. The Maine was what he named the lode. He was too poor to ride, so he walked to Pueblo, Col., with a chunk of the ore in his kit. This he showed to O. H. P. Baxter, and as Bassick did not even have enough money to pay for an assay, Baxter had it assayed. It was so rich in gold that Bassick started back for his mine in a big hurry, so afraid was he that some one might steal it. The first few tons he sent to the mill returned him $12,000.

Old-timers tell a funny story about Bassick's use of his newly acquired wealth. As sailor and prospector he had lived on salt junk and bacon for many years, and the very sight of fruit was a luxury that was only dreamed of. When he got his first mill returns he posted off to the nearest town and bought up every bit of fresh and canned fruit he could obtain, and had a royal gorge. The tinned fruit he deposited in a specially built cellar, and it lasted him six months. Bassick is a very dignified old gentleman now, and doesn't relish such recitals.

In a year and a half he took out fully $500,000, and in July, 1879, sold the mine, receiving $500,000 and a tenth of the stock of the new company.

Under the new management there was the most extraordinary extravagance, but notwithstanding this it produced $1,679,000 between July, 1879, and the date of its wreck in 1885. Of this sum, however, only $425,000 reached the owners, great amounts being squandered in useless machinery, etc. Mechanics' liens were what closed this great producer. With $138,000 in the treasury in March, 1884, the company was $60,000 in debt within a few months. The holders of the liens did not come in battalions, but singly. First one obtained a judgment and order of sale and then another, till it got to be part of the court proceedings to order sales of the Bassick on liens. E. C. Bassick, through Hugh Butler, made the first purchase, Staples, a Bridgeport banker, and Ryan made more, and this sort of thing was kept up until the summer of 1893, when a sheriff's deed was issued to Ryan, who had settled the taxes and received redemption certificates and tax deed from Custer county.

This but involved a new series of litigation, Bassick and Staples still contesting ownership, and quite recently Judge Hallett gave a decision in favor of Staples and against the company, based on some deal between Bassick and Staples nearly ten years ago, which decision fastens another debt of $60,000 against the company.

Brighter days began for the Bassick last year when ex-Senator Warner Miller and associates, of New York, took a bond and lease on the property and formed the New Bassick Mining Company, capital $5,000,000, in shares of a par value of $5 each. There was a sudden eclipse when the crash came last summer, the New York men abandoned the enterprise, but here the Ryans stepped in and took active control with the result of the organization of an entirely new company, the one just incorporated.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ABOUT THE GOVER.— *Ledger:* When tbe Utica people abaudoned their proposition to take the Gover mine and operate it, everybody interested in the property either as owners, mortgagees, attorneys, attaching creditors or lien holders, turned their attentiou to the matter of getting the mine in operation while it was still in the hauds of the sheriff and before it was allowed to fill with water.

The result was that an agreement has been drawn up and signed by nearly all the interested parties to the effect tbat the Gover Company will execute a second mortgage upon the property for an amount sufficieut to cover all claims against the company, the mortgage not to be foreclosed for three years from Sept. 1, 1894. The attachments are all to be withdrawn and the company to resume work immediately upon the execution of the agreement.

The lien holders are to prosecute their liens to judgment, hut are not to take execution thereon uutil three years have elapsed. The disposal of the money resulting from the cleanups made by the sheriff, after that officer's expenses have been paid, is to be left to the Superior Court. It will be remembered that the Gover mine was shut down some months ago by a number of attaching creditors, who were paid in time checks which the company was not able to honor. Since that time it has been in the hands of the sheriff, with instructions from the Superior Court to keep the water out, aud that has been done. There is a mortgage of $15,000 upon the property, held by the Anglo-California Bank of Sau Francisco.

Butte.

FORBESTEWN MINING NOTES. — *New Era:* There are several tons of sulphurets at the Denver mill to be worked at the Shakespeare Reduction Works.

Price and Blair intend starting up the Johnson mine. This property is situated near Hansonville aud has a ten-stamp mill on it, and the ore is of high grade but rebellious. There has been several attempts to make this mine pay, but all have failed.

The tunnel now being run by the Gold Bank mine will be 1200 feet in length aud tap the ledge at 1000 feet. Tbe present shaft will be connected to the tunnel by a 700-foot raise. When the tunnel is completed, the mill will be moved and au addition of forty stamps will be made.

Calaveras.

MINE BONDED. — *Prospect:* Tbe Parnell mine at Smith's Flat has been bonded to R. Montenegro, and work will be commenced at once. A ten-stamp mill will be put up on the mine, and the work of crusbing rock will soon be in progress.

Inyo.

NEW FINDS ON THE DESERT.—Dr. J. A. Mack and E. B. Waite of Redlands have just returned from the Panamint country, where the Redlands Gold Mining Company have some very valuable property, upon which they are erecting a mill, says the San Bernardino *Times-Index*. These gentlemen are not interested in that enterprise, but have been prospecting about six miles this side and have made twenty-two locations within a radius of twelve miles. On the Yolanda, at a depth of fifty feet on an incline, they have a ledge twelve feet wide and have seventy-five tons of ore on the dump. The formation is a shale and talcose slate, which is very favorable for gold. The ore is a honey-combed iron quartz and shows considerable free gold, besides sulphurets. Assays as high as $1200 in gold have been obtained. They also have locations that show galena in quartz running three and one-half ounces in gold. Tbese claims are located about four miles north of the county line in Inyo county. They brought in a large number of specimens from these properties that by their appearance indicate their value.

The only drawback to the country in which these properties are located is the great distance from the railroad—it is over 100 miles north of Daggett—and the scarcity of wood and water; but with rich ore and plenty of it, such difficulties can be overcome.

Nevada.

PROVIDENCE MINE.—*Transcript:* The Providence mine has always been regarded as one of the most reliable gold-quartz mines in this district. The property is in splendid working condition. An immense amount of rock is being taken out, sufficieno to keep thirty stamps in operation night and day. The ledge from which the rock comes is fully eight feet thick and all of it is of a very fine quality. There is enough ore in sight to keep the mill running for a very long time. The company has also a very large track of virgin ground which will take many years to work out. The prospects there were never more flattering than now. There are eighty miners employed in the mine, besides other help.

THE SOUTH IDAHO.—*Transcript:* Another rich strike has been made at the South Idaho mine in the south drift. The ledge is large and the rock taken out contains considerable free gold. This mine is located south of the famous old Idaho.

Shasta.

Courier: At the Niagara mine there are twenty-five men now on lease work. Tbere is a great deal of work being done ou all the mines in that vicinity all the way from French Gulch to Deadwood. At the Gulch a good many of the boys are waiting for the Gladstone to resume operatious, although a large number of them are at work either in neighboring mines or else prospecting and opening new mines for themselves. At Whiskytown and vicinity there is also quite a stir in the different mines, several mine-owners and prospectors being there.

CRUDE METHODS. — The following pointed criticism is from the Yreka *Journal:* The quartz and placer mines of this county, if worked with the improved methods of the central sections of California, would pay much better than at present. Quartz ledges in most sections below pay expenses of milling at $2.50 to $2.75 per ton, but such grade of quartz would uever pay here, in fact would entail a heavy loss on operators under present mode of working. With good and improved machinery of the newest invention, there is hardly a single ledge in this county that would not yield profitable returns.

Even the noted Black Bear mine at Salmon river, supposed to be worked on a scientific scale, is very poorly equipped. The stamps of the mill have only four foot plates in front of each four stamps, with no plate sluices extending out to catch the gold, not even blankets or concentrators to secure a large portion of the dust escaping with the tailings. Neither has any effort been made to save the tailings, which if scientifically treated would yield largely.

The blue gravel mine at Greenhorn could also be worked on a better basis than at present, by running a six-foot tunnel up the channel, and making crosscuts, instead of running several branch tunnels, in which a man cannot stand up straigbt. A single large tunnel, with rails for hauling large cars to the shaft by steam, would be a great improvement, as on taking out the gravel from each crosscut it could be filled up again with the boulders, or timbered if there are no boulders in the gravel taken out.

Our river claims could be worked more successfully by the use of a donkey engine, to do all the hoisting and pumping to better advantage than the clumsy and unwieldy current wheels, and no doubt many new methods could be introduced with profit in the placer and drift diggings throughout this county, which is recognized as a vast region of rich mineral deposits.

MINING NOTES. — *Journal:* Austin & Co. have struck rich blue gravel again at Greenhorn, but owing to scarcity of water are working a small force. They are making preparations also to be in readiness for the rainy season when winter is at hand, by raising a new shaft from the end of their present tunnel, with steam blowers to supply fresh air. The new shaft will probably be completed to the surface in about two weeks, at wbich time the steam plant, pumping machiuery, hoisting apparatus, etc., will be removed. With tbis new shaft completed, the blue gravel at the upper end of tunnel cau be hoisted out with greater ease, besides proving safer from the danger of foul air in working long distances from the main shaft to the surface, 100 feet or more above.

The Elliott creek district on Siskiyou mountain, near the Oregon boundary, is loomiug up as a rich mining district, and many rich placer claims have been located.

At Horse Creek, Klamath river, the rich high-bar diggings, which prospected so haudsomely with the old-fashioned rocker, are to be worked on an extensive scale as soon as the new ditch now under construction is finisbed, to supply water for sluicing.

The river miners iu the Oak Bar section are getting down in their claims, and will soon be taking out considerable gold dust.

Tuolumne.

MINING NOTES.—*Independent:* The Dutch Mine—This mine is keeping the water out of the shaft preparatory to commencing active operatious.

The Sweeny Mine—This mine adjoins the Dutch to the north. Men are employed timbering up the shaft and putting things in shape for work.

The App is steadily working. They have crosscut a twenty-six foot vein, which looks well.

The Miller and Holmes—They have erected a two horse whim and are busily cross-cutting and exploring their mine at 200 feet deep, with very encouraging results.

The Golden Rule—This mine has erected a five-stamp mill and are crushing good payable rock.

The Webster Mine—This mine has recently changed hands, for a large figure. This is a very valuable property. It is sold, it is said, to an English company.

The Stanley-Kanaka Consolidated mines were visited by mining men the past week, who were well pleased with the outlook. This property contains a vast deposit of low grade ore, which needs a powerful crushing plant; driven by water power would be a grand success.

The Rawhide—This splendid property is running twenty stamps on their usual rich ore. Tbe company are about to erect a complete chlorination plant, to reduce and treat their sulphurets, which are of usual high grade, from the mother lode. This mine has quite a village of its own, within its enclosure.

The Rappahannock—This company are busily engaged in putting up a five stamp hoist. The engine and boiler are already iu place The Poppet heads will soon be erected, then the whole will be covered in by an extensive building, with every suitable convenience for steady sinking. Cornish pumps, will be used to handle the water. This property starts under very good auspices. The rock shows free gold, and an assay of the sulphurets gave $1100 to the ton.

The Isabella and Gem—Several experts have been visiting this property, the past week, with purchasing intent.

The Harris aud Oliver—Mr. Dawson has been actively prospecting this mine with the view of purchase.

The Gem mine is steadily keeping the ten-stamp mill pounding away on good payable ore. The miue was visited, last week, by a would-be purchaser, but foolishly the owner has tied it up, (as it appears), almost indefinitely, possibly, to their sorrow. No mine owner should bond his mine, unless a good deposit of cash to show good faith is put up.

NEVADA.

Washoe District.

The faces of the ore body ou the 1650 level of Con. Cal. Virginia continue to look well. Have extracted during the week 350 carloads of ore—about 347 tons—the average assay value of which, per mine car samples, was $61.58 per ton. On the 1700 level, twenty-two feet below the south drift No. 3, the work of timbering iu the south drift has been completed, and this south drift has beeu extended teu feet, all the way in ore which will average $60 per ton; total length of drift, 46 feet; face in ore, the average assay value of which is $72 per ton.

A northeast drift started at a point on the 1000 level, 30 feet in from the mouth of the crosscut run east from the bottom of the winze—down 28 feet—which was sunk on the east side of tbe main drift, 280 feet south from the shaft station, has been advanced 33 feet; face in porphyry, clay and quartz. The west crosscut started from the main drift, 345 feet from the shaft station, has been advanced 25 feet; total length, 185 feet; continuing in porphyry aud quartz formation of low value. Some repairs have been made in the main drift. The Con. Virginia shaft from the 1300 station down to the 1500 station has been secured and water pipe bas been put in place, and are now continuing the same work upward from the 1300 statiou. Have shipped to the Morgan mill during tbe week 651 tons and 700 pouuds of ore, the average assay value of which, per railroad car samples, was $65.26 per ton. The average assay value, per battery samples, of all the ore worked at that mill during the week—660 tons—was $53 per ton. Bullion uow on hand iu assay office—assay value about $13,000. Bullion shipped to tbe Carson mint—assay value, $35,767.94.

The upraise on the 1465 level of Ophir, 70 feet in from the mouth of the east crosscut, has been carried up fourteen feet in porphyry, clay and quartz. Tbe face crosscut running east from the uorthwest drift from the Mexican shaft in tbe central tuunel is in porpbyry, clay and quartz showing some value. The west crosscut in Mexican on tbe 1465 level from the top of the upraise is in porphyry showing fine lines of quartz. The Union Con. and Sierra Nevada joint uorth drift is in bard porphyry. A west crosscut at the top of the north drift on the 200 level of Best & Beleber is in quartz and porphyry. The face of the south drift on tbe 200 level of Gould & Curry is in soft porphyry.

From the several openings above the 400 level of Occideutal have extracted about fifteeu tous of ore of tbe average assay value of $34 per tou. The west crosscut started near No. 3 upraise on 500 level is now in 92 feet; face in hard porphyry.

Kennedy District.

A bonanza has been opeued in the Paymaster miue in Water canyon, Kennedy district. Weduesday last the workmen uncovered a two-foot vein of rich sulpburets.

The Hidden Treasure miue at Kennedy is proving itself to be oue of the best mining properties in that district. For 1200 feet on the surface the ledge has been traced. A tuuuel has beeu run seventy-five feet near the center of the claim, intersecting the vein. At this point the ledge is about two feet wide, carrying eight to twelve inches of rich ore, from which sixteen tons were shipped, without selecting or assorting, giving $104 in gold and oue ounce in silver to the ton.

LINCOLN COUNTY.—Several gold districts have come into existeuce within the past two or three months, the youngest being that located in the Cedar basin, some twenty-three miles northeast of St. Thomas, Nev. The basiu forms the northeast corner of a triangle with St. Thomas and Bonellie's Ferry on the Colorado as the other two points. The developmental work which has been done there plainly shows that it is a very rich gold district, aud the indications are that within a comparatively short time it will be numbered in the ranks of the producers of the yellow metal.

NYE COUNTY—CRESCENT DISTRICT.—*Record:* H. Elridge and J. E. Langford, of Salt Lake City, are on their way to Crescent district, Nye county, Nev., for the purpose of putting up a ten-stamp gold mill of the Gilpin type, and also a saw mill in Timber mountain. They have purchased some twelve claims outright, the well-known Mackay claims being of the number. The ten-stamp mill and also the saw mill, together with four miles of piping for the purpose of piping the water to the mill, and some 12,000 pounds of supplies, etc., left Milford by freight teams on the 13th of this month, and will go by way of Hiko and Indian Creek. The ore is of an easy character to work and goes enough in gold to make the workiug of it very profitable. Negotiations looking toward the sale of the above properties have been in progress for the last four years, but, on account of its remoteness from any market, were unsuccessful until Messrs. Eldridge and Langford last winter visited the section and immediately were well pleased with the outlook, and first took a bond and subsequently purchased them outright. The amount that was paid we are at present unable to learn.

ARIZONA.

HYDROMAGNESITE.—Messrs. Williams and Dubois, Yavapai county, have recently discovered magnesia, known in its crude state as hydromagnesite. A thirty-pound sample will be sent to Keasbey & Madison, Ambler, Penn., who are refiners of magnesia, to determine its commercial value. The croppings indicate a blanket, stratified structure in a basalt formation. Its specific gravity is about 100 eubic feet to the ton. It is of a white, creamy color, soft, light and powdering to the touch, very much like flour. with no perceptible grit, taste or odor. There are a hundred tons in sight; the ground overlying the deposit is a soft, light soil that can be removed witb a scraper.

GENERAL MINING NOTES.—Prescott *Journal Miner:* Parties will shortly put up a quartz mill on the Hassayampa at or uear the site of the old Sterling mill.

Over one hundred tons of ore were worked at the Kingman samplers this week, the total value of which is away over $30,000. This is a much better showing than any other miuing camp in Arizona can make tbese dull times.

A report comes from the Gladiator that the work of crosscutting the ledge has been finished and that a body of rich ore has been reached. This latest strike is said to definitely settle any doubt tbat bas heretofore existed over the mine, the character of the ore and size of the ledge being such as to give the mine prominence in tbe mineral world.

COLORADO.

MONARCH DISTRICT.—INDEPENDENCE GULCH: One of the richest strikes ever made in the Monarch district says a Salida dispatch is that reported in the property of the Grout Mining company iu Independence gulch. The workiugs are on a contract between granite and porhyry and consists of a tuunel on the vein about 115 feet in length. The last twelve feet have been showing a fine body of heavy lead ore rich in silver and carrying a good quantity of gold. The lead contents being from 50 to 60 per cent, and the gold and silver bringing its value up so that it will yield a very handsome profit. Beginning with a few inches the ore body wideued to three and one-half feet and gives promise of being a very strong and well defined ore.

THE LEASING SYSTEM—*Mining Industry:* Reports from the mining districts of the State show that an uuusally large number of persons are working properties under lease. Indeed at Aspen the number of lessees almost equals the number of workers for wages, and the making of leases is a thing of almost daily occurrence in other camps. This is one of the very natural results of the depression in silver mining. Many of those thrown out of emplcyment by the elosing of miues and mills, bave but scarce means to carry them through an indefinite period of idleness, and have families dependent upon them for support. They must in some way make somethiug of an income. Therefore as a sole and last resort, they undertake to work ou lease properties which do not promise profits sufficient to satisfy corporations or individual owners of means. They do not expect to make fortunes or perhaps to realize any considerable profits. But they do hope to dig out enough to enable themselves and their families to live.

BRITISH COLUMBIA.

MINING NOTES.—The Kootenay Hydraulic Mining Company is again on a firm footing.

The Nelson Hydraulic Company, after spending $15,000, is about ready to turn ou the water.

The Utica, Alice and Rocky Boulder, on Twelve Mile creek, a branch of Kaslo river, have been bouded for $20,000.

About seventy-five men are workiug on the Cariboo creek diggings. Lumber is being packed up at $50 a thousand. One cleanup of an ounce a day is reported and bedrock had not been reacbed.

Four prospectors have discovered a very large body of low grade gold ore near Nelson on Kootenay lake. Itruns $10 to the ton and is free milling.

A mining engineer of Goldeu has been reporting on the seventeen claims the Calgary Company propose working on Cariboo creek. It looks as though there would be considerable deep digging to reach bedrock in some places, as the formation is cuppy and syenitic.

Boundary Creek District.

"Between 350 and 400 miners are at work in the Boundary Creek district," says H. P. Palmerston, manager for the Midway Company. "We never hear any talk of hard times in our country. There is not an idle man to be met with in a week's travel and everybody is contented. Laborers get $2.50 a day, miners $3.50 and carpenters $3.50 to $4. I don't mean that there is such a demand for help as to justify a stampede. We make a rule not to employ the nomadic element, but no one who comes with an honest purpose to establish his home with us is required to go begging for employment."

The Boundary Creek district lies beyond the British Columbia line.

The provincial government is making a new wagon road from Midway across the mountain to July creek, designed to furhish an outlet for the Copper, Deadwood, Greenwood, Providence, Skylark and Wellington camps. About eighty men are employed on this work. The provincial legislature recently appropriated $20,000 for the road, and this with $8000 left over from last year gives $28,000 available.

The ores of the Boundary Creek district are largely copper and lead and the ore bodies are enormous. The Skylark, owned by the Spokane and Great Northern Mining Company, is shipping two carloads a month. It is high-grade silver ore, carrying about two ounces of gold to the ton.

The Great Hopes property, owned by Crowder, Cornthwaite and McMartin, has been operating an arrastra with good results.

Patton and White are opening up the Ironsides in Greenwood camp. They bave a ledge 150 feet wide of gold and copper ore.

Tbe Snowshoe ledge, in tbe same camp, is sixty feet wide. Denzler, Gibbs and McDonald, the owners, have a force of men at work developing it.

Only assessment work has been done this year on the properties in the Copper camp. The Copper mine is bonded to W. T. Thompson of Fairview, B. C., and eastern associates

for $80,000. It has an undercrop of sixty feet. Forty feet of this is red oxide, carrying eighteen per cent copper.

Some development work is going on in the Deadwood camp, particularly on the mother lode and Sunset.

The St. Lawrence, in White's camp, was recently sold by C. C. Sands to Mr. Colby of Spokane.

WASHINGTON.

OPALS AND GOLD.—The Keith brothers from Duchesne plains on the Salmon river, near its confluence with the Snake, are in Spokane with a large number of opals taken from the mines recently discovered there. These mines are attracting opal hunters, and already a large number of claims have been staked out. A nugget of gold was panned out recently weighing nine ounces. This has caused a big influx of placer miners to that section of Idaho.

NEW CAPITAL FOR OKANOGAN.—M. G. Barney has returned from the Okanogan mining region, where he chaperoned C. Schaer of Chicago, J. T. Klick of St. Louis and Peter Berg of Warsaw, Wis. Mr. Schaer represents several other eastern capitalists who recently bought of Messrs. Barney and Rush a half interest in the Oro group of Palmer mountain. The owners intend putting on a force of men at once to develop the property.

Messrs. Klick and Berg are heavy stockholders in the Rush Mining Company, of which Mr. Berg is now the resident manager. There are 15 men at work, with excellent results. The new machinery is on the ground, ready to be set up. They have a six-stamp mill with concentrator attachment. Mr. Berg is an experienced miner and is highly pleased with the outlook in the Okanogan gold camps.

REPORTED STRIKE IN THE IDAHO.—A new lead has been struck in the Idaho mine in the Solcan country. Fabulous stories are circulated as to the extent of the strike, but no definite information was to be obtained except that the valuation of the property has increased fully a quarter of a million since the new discovery.

IDAHO.

COEUR D'ALENES—AN AGREEMENT REACHED. The following is the agreement entered into by the mining companies of the Coeur d'Alenes and the miners' union, as published in the Murray *Sun*:

This agreement, made and entered into at Wallace, Idaho, this 30th day of July, 1894, by and between the Milwaukee Mining Co., the Standard Mining Co., and the Coeur d'Alene Mining and Concentrating Co., parties of the first part, and the Central Executive Miners' Union of the Coeur d'Alenes, by Edward Boyce, its president, parties of the second part, Witnesseth: For the purpose of settling the difference existing between the parties of the first part and the parties of the second part, the following agreement has been entered into:

The present maximum wages of $3.50 per day shall be paid to all undergrouud men.

There shall be no discrimination in the employment of men; the men now in the country shall have the preference. No men shall be imported for the purpose of working in the mines.

The men who lately left the employment of the company, who were objected to, shall not again have employment in any of the above mines.

It is hereby agreed by both parties hereto, that should any differences arise between the parties hereto, that the same shall be settled by arbitration.

It is the desire of both the above parties that the long-existing differences be and are hereby buried for all time; that henceforth both parties be friends and work for the mutual benefit of both parties.

Coeur d'Alene *Miner:* The Gem mine is now running smoothly with its full complement of miners.

The Bunker Hill Company has been dropping off some of the contractors and is doing the same work under day's pay. There are 260 men at work at the mine and in the shops, tramways, etc., around it, those at work in the mill bringing up the number to about 300 in the employ of the company. The pay rolls last month amounted to $38,000. All work beneath the level of the Reed tunnel has ceased for the present.

The Poorman is again in full blast, with about 175 men at work. Burke has, consequently, resumed its old-time activity.

MONTANA.

THREE MEN DROWNED.—While stoping the 300 and 400-foot levels in the Glengarry mine, near Butte, last Tuesday, the miners broke through and into the old workings of the Ground Squirrel and Monitor, two adjoining mines which have not been worked for some time and had filled with water. The water in an instant filled the workings from the 400 to the 200-foot level. Nearly all the men succeeded in climbing to points of safety on the upper levels, but at least three men are known to have been caught, and it is feared that the number will be increased after investigation. Those known to be in the mine and drowned are Michael Brady, aged 30; James Morgan, aged 26, and Joseph Curry, aged 24, all single men. The bodies cannot be recovered for many days, as the water in the flooded mine is still rising rapidly, and it will be necessary to pump it all out before the dead men can be reached.

Articles of incorporation have been filed in Jefferson county of the Phœnix Mining and Development Company. The incorporators are James L. Buskett, D. B. Vincent, Oscar S. Heyer, A. J. McLean and John Nelson. The office is at Basin. The capital stock is 500,000 shares, at a par value of $1 each.

At Winston the machinery for the underground hoist of the Custer Mining Syndicate has arrived and all necessary arrangements made for the reception of the hoist in the 400-foot level of the Aguafrio mine. The force has been increased, numbering 125 men. The Free Coinage is a silver proposition, and at the present price of the white metal cannot be profitably worked, but the owners are stayers and for eight months have been piling ore on the dump to await a change in prices.

MEXICO.

ALTAR DISTRICT.—Rock has been taken out of a mine at Cueva Santa which assays $200 a ton. These mines are in what is called the El Altar mining district in the northern part of Sonora, something like 100 miles below the American line and fifty miles from the Sonora railroad. There are also rich placer diggings there which give employment to over 2000 Indians, who extract the gold by means of dry washers. The latter make as high as $5 and $6 a day. It is very difficult to obtain a foothold there by any one not now in possession of a claim. Everything seems to be in the hands of the State officers, and, unless they are properly appointed, it is impossible to get possession of anything.

AUSTRALIA.

A BIG GOLD STORY.—*Town and Country Journal:* Reports have reached Perth of an enormously rich find of gold about 10 miles southwest of Coolgardie. The reef from the mine, which is called the Londonderry, was discovered some time ago by a party of prospectors; but its discovery was kept secret until very recently by the owners, Messrs. Jobu Mills, John Huxley, William Gardiner, Henry Dawson, Toomas Elliott, and Peter Carter, in one day banked up 4280 oz. of gold dollied out of less than two tons of quartz, and they have in their cump fully another 2000 oz. of gold in specimens. The claim is so rich that the proprietors, by dollying, have turned out gold at the rate of 1000 oz. every three days. At present the mine has not been nearly developed. The excavation from which £25,000 worth of gold has already been dollied is very small. Several claims have been pegged out in the vicinity of the new find. The Premier, Sir John Forrest, has been interviewed by the mine owners and other persons with regard to the influx of Afghans at Coolgardie. He stated that he would take steps to prevent these aliens getting possession of the claims and competing with European labor. If necessary he would introduce fresh legislation to make the gold fields the possession of the British. Regarding the extraordinarily rich reef which has been discovered at a lease 12 or 13 miles southwest Bayleys, known as Londonderry, 5000oz. which were obtained from there are already on view in the strong room. An escort is bringing more gold to-day. One boulder is more than a man can lift. The reef is about 4ft. 6in. wide and is one mass of gold. The mine is pronounced by Mr. Beaglehole and other experts to be considerably richer than Bayley's; there is no alluvial. Great excitement prevails here as it is undoubtedly the finest show the world has ever seen. The reading of this news from Coolgardie created tremendous excitement at Perth, and a rush is likely to set in.

Latest accounts of the rich find at Londonderry state that the gold is contained in a quartz reef, and the show is better than anything ever seen in Bayley's Reward. The mine is marvellously rich in coarse wiry gold, and the metal is so thickly scattered through the stone that after the rock is fractured it has to be wrenched apart. The workings consist of a trench outcutting across a reef measuring 5 ft. long by 2 ft. wide and 3 ft. deep, and a shaft 40 ft. deep sunk away from the reef cutting; 4000 oz. of gold were dollied in four or five weeks, while the specimens, measuring a foot square, are so heavy that one cannot lift them. One splendid block equal to a 9 in. cube in size is so rich that Mr. Elliot, one of the party, paid his mates £2000 for their share in it. 760 oz. were brought in to Coolgardie by a party of three men, who dollied it in a few months near Hannan's. The heaviest gold escort which has ever left Coolgardie will start for Perth in a few days. Gold is accumulating rapidly in the banks, but it is impossible to dispatch the escort this week, owing to the police being absent at the polling booths.

Anti-Debris Committee.

There was a meeting late yesterday afternoon of the Executive Committee of the State Anti-Debris Association.

W. T. Phipps, the manager, submitted his monthly report, showing the operations of the watchmen for the past month.

A communication was read from the United States Debris Commissiou in relation to certain complaints made to the Commission by the Association.

George Ohleyer, of the Legislative Association, reported having taken steps toward refuting certain false assertions made by the mining press.

The Executive Committee instructed the attorney for the Association, Robert T. Devlin, to commence legal proceedings against a certain miner reported as operating contrary to law and to the injury of the rivers.

The Committee agreed that illicit hydraulic mining is now under control, and that the condition of the river is improved.

An adjournment was taken to the third Tuesday in September.—Sacramento Bee, Aug. 22.

MINING

DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to **The Correspondence School of Mines, Scranton, Pa.**

RUPTURE!

It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekl He guarantees every case he treats, and es not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

NOTICE OF ASSESSMENT.

GOULD AND CURRY SILVER MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia, Storey county, Nev.

Notice is hereby given that at a meeting of the board of directors, held on the 27th day of July, 1894, an assessment, No. 74, of fifteen (15) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 30th day of August, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 21st day of September, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the board of directors.

ALFRED K. HURBROW, Secretary.

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WM. NANCE.....Grass Valley, Nevada County, California.

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The dictionary gives evidence of a large amount of painstaking work on the part of the author, and possesses features which must be commended. Among these, the author, wherever occasion required it, has furnished the synonyms of terms, and the book is given an additional value by an alphabetical index, which enables it to be consulted for terms both collectively and individually. The work will prove of value to the reader, whether professional or non-professional. The definitions are put tersely and concisely, so that the inquiring reader can carry away a defined, net impression as to what is meant. Any student who will spend his leisure hours over the volume will be amply repaid for his time and trouble. The book is very clearly printed in bold type on good paper, and is well bound.—*N. Y. Electrical Engineer.*

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Scientific Progress.

Testing the Dryness of Steam.

At a meeting of the Institution of Engineers and Shipbuilders in Scotland a method of testing the amount of moisture in steam was explained. The principle, which is more particularly applicable to marine engiues, consists in comparing the saltuess of tbe steam with that of the water in the boiler. The test is carried out by means of nitrate of silver, and the reaction is so delicate that witb only one per cent of sâlt in the boiler one per cent of priming water can be accurately determined to the second decimal. The process is as follows: To one part of salt boiler water there is added 100 parts of pure condensed water, and into this there is poured a small quantity of concentrated solution of yellow chromate of potash. Then a nitrate of of silver solution contaiuing about one-tenth per ceut of this salt is slowly added. With each drop the water turns locally orange red, but tbis color disappears at first; later on, when all the salt bas been acted on, the whole fluid cbanges color from pale yellow to orange. Tbe quantity of nitrate solution is noted, and then the experiment is repeated on the condensed steam from tbe engine, undiluted with distilled water. Tbe ratio of the quantities of nitrate of silver solution used in the two tests expressess the amount of priming in per cent.

THE experiment has recently been tried with towboats in Britisb waters of driving three screw-propellers with two triple-expansion engines. Tbe central screw is turned by the two low-pressure cylinders, and the side screws by the high and intermediate cylinders of the different engines. Thus the steam takeu at 160 pounds pressure enters the high-pressure cylinder on each of the side shafts, exhausting into its own intermediate ou the same sbaft, then into the low-pressure cylinders of the central shaft.

ELECTRIC WELDING has been used to remedy blowholes in defective castings by first drilling or chipping out the defects and then heating tbe casting around the blowhole in a gas or oil flame blast. Scraps of steel are then introduced, and the electric welding is applied to melt them. The result is said to be a perfect joint, without seam or flaw of any kind.

A CINCINNATI CHEMIST is reported to bave invented an artificial milk composed of water, solids aud fat. This artificial milk will raise a cream from which first-class butter can be churned. It will also turn sour aud is capable of being made into cbeese. The inventor will next, it is presumed, turn his attention to the invention of an artificial cow.

"OZONINE" is the name given by a German chemist to a new bleaching agent, composed of 125 parts of resin, 200 oil of turpentine, 90 peroxide of hydrogen, 40 water and 2.25 potassium hydrate. These combine at first in the form of a jelly, but this liquefies after a few days.

EXPERTS are puzzling over the term "magnetic sbells," used in reports of the armor tests at Okhta, by the Russian authorities, and interpret it as meaning that tbe point or cap is held on to the rest of the projectile by magnetic attraction.

STEEL, instead of copper, is being used as a material for fire-boxes in Austria, and is not, as was supposed, a purely American expedient. Before being bolted into place the plates are freshly heated and cooled to eliminate any brittleness.

ACCORDING to tbe *Echo des Mines*, a new explosive has been accidentally discovered in an unexpected quarter by M. Rossel, a French cbemist, who found that a mixture of aluminum filings and sodium dioxide took fire witb explosive violence when in contact with a little moisture. The preparation of tbe explosive is very dangerous, as, when it takes fire, fiercely burning particles are projected in all directions, the heat bciug great euough to fuse copper wire.

How Gas Companies Work the Public.

Among the papers read before the Western Gas Association at its recent meeting was one by Mr. Wilkiemyer upon "The Best Method of Introducing Gas Stoves." In the discussion which followed Mr. Evans told how bis company worked the subject as follows:

We adopted rather a novel method of introducing gas stoves, by distributing circulars to every family on tbe line of our street mains, offering to give them a gas range free. Of course the object of this circular was to bring possible consumers to the office, where we could explain what we meant by it. Of course we had a "string" to the offer. Our explanation was simply this: If tbe consumer would pay for $20 worth of gas in advance we would give him a $25 gas range, or, rather, a gas range be could not purchase for less tban $25 at retail. Of course they could not understaud such au offer. Our explanation was tbat by the use of $20 worth of gas, baving acquired the knowledge of bow to use gas properly, they would become permanent consumers. Of course the facts were simply tbese: Tbey paid for tbe gas in advance; we had the money to buy tbe stoves with; we made a profit on that $20 worth of gas sold which was nearly enough to pay for tbe stove (laughter); and we got a permanent consumer. Perbaps I will modify that a little by saying that it does not cost any more to distribute 200,000 feet of gas than it does to distribute 100,000 cubic feet. In figuring on the cost of gas, in that deal especially, we figured on the cost of gas in the holder; aud our profits accrued on tbe margin beyond that. As a matter of fact it did bring us in immediate business. On that plan we put out 1500 gas ranges within three months; and those gas ranges brought us in a consumption of 150,000 feet per day; and as a matter of fact we made $9.40 per thousand profit (laughter)—I mean $9.40 worth of profit on each $20 worth of gas sold; and between tbat and what the gas ranges cost us was certainly an advertisement tbat paid us to adopt that system.

An Improved Alloy.

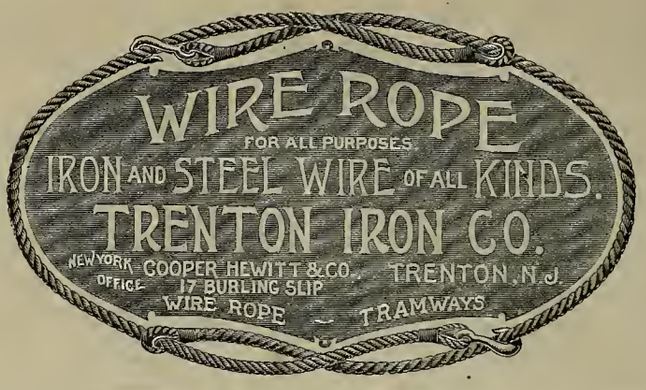
Fifty parts of copper, forty parts of zinc and aluminum in tbe proportion of two and a balf per cent of the wbole are taken. This is one example, but others may be obtained by varying the amounts of copper and zinc to the same proportion of aluminum.

The mode of preparation of the alloy varies: For a bard metal, the copper and aluminum are first mixed to form a copper alloy and the zinc added in small pieces during continuous agitatiou of the molten mass.

This gives a reddisb alloy that takes a higb polish. For a ductile metal the zinc and aluminum are first mixed and the copper then added. Tbis gives an alloy resembling brass. In both cases the metal is claimed to be uon-oxidizable, proof against sea water, and, to a large extent, against acids.—D. W. Sugg, London.

EAST-BOUND railroads recently assisted tbe return movement of immigrants to their homes in Europe by making a $5 rate from Chicago to New York. It is said that "tbe $10 steerage rate has caused a movement averaging 1000 emigrants per day, who are mostly from the east of the Alleghenies." A $5 rate from Chicago to the seaboard, it is thought, "would result in tbe return of at least 500,000 additional people to tbe old country."

ACCORDING to the method wbicb is now adopted for reckoniug leap year in England, December, January and February will be the summer montbs about 720,000 years hence.



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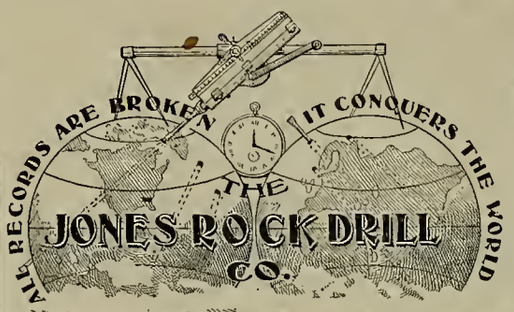

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Rich Mining Belt.

Correspondence Nevada *Herald*.

There are three valuable gold belts, from which there has been one hundred and forty millions of dollars in gold extracted from quartz alone, in the Nevada, Grass Valley and Alleghany regions, the Alleghany district extending from Moore's Flat across the ridges to Forest City.

At Moore's Flat there are several fair prospects, but with the exception of one, the Metropolitan, little has been done. On this mine considerable work has been done. The property is 3000 feet by 600 feet, the ore vein being two and one-half to three feet thick. The formation is serpentine and slate. It is claimed that there is good milling ore and plenty of it in sight. One tunnel is in on the vein over a thousand feet.

Surrounding the beautiful little mountain town to the south are some of the richest hydraulic gravel claims in the State, from which many millions of gold have been taken. They are very extensive. All are now closed, and where once was a busy, thriving little town, and happy and contented people, is now decay and desolation.

How easily all this condition of affairs could be changed if the gold, millions upon millions of it closeted here in Nature's vaults, could be taken out and made a blessing to both farmer and miner; for it is now well known that the proposed system of dams lower down upon the river would restrain all the tailings and also hold back billions of tons now in canyons and creeks, which without the dams will be washed down into the valleys.

There has been some work going on at the McKillican mine, on the river just opposite the town of Moore's Flat. Some very rich deposits of gold have been found in this mine, it being a continuation of the Plumbago mine at Chipps' Flat. The Plumbago mine is being worked by a tunnel, or a system of tunnels, several hundred feet in length. The vein is on the north bank of the South Yuba river, just across from Moore's Flat. On the same vein are several fine properties, viz., the McKillican, Hope, Colorado and Yellow Jacket. These properties have, at one time or another, paid handsomely. Gold to the amount of thousands has been taken out of these rich deposits. Several parties have quite recently made an examination of the Plumbago, with a view to purchase.

The Gold King mine of Alleghany was discovered by H. Y. Johnston, and is a northeast and southwest ledge, with a pay chute 300 feet long, the ore paying from $15 to $18 per ton. The company has a shaft down 250 feet and is now building a new ten-stamp mill.

On French ravine, the next ravine southwest, there is a good prospect which bids fair to be a mine, and a rich one. Two deposits have been found upon the croppings of this ledge, one of $12,000 and one of $14,000. The ore shows plenty of free gold and sulphurets.

The Idaho mine in Wet ravine joins the old Oriental mine on the south, and is, in my opinion, on the same vein, the writer having seen this mine open several years ago. It is about the same character of ore, but a trifle better grade, and apparently is more evenly distributed throughout the vein.

The Rising Sun mine is pretty well opened by a series of tunnels and shafts. The work is well directed with a view to open a good mine. The vein is strong and shows mineral freely. Mr. Hellman, its manager, has spent considerable time and money in bringing the mine to its present state. One can see no lost opportunities or money wasted, for they sometimes waste money, even in gold mines. I should say there is one ore chute pitching south which will prove a valuable one. A new mill is to be erected and the grading for it is now being done.

The Mariposa mine is looking well. The Sierra mine, just across the creek, is on the same vein. It is owned by Johnston of the Gold King, and has given good returns. The Rainbow has at times been a rainbow of gold to its fortunate owners. It has yielded many thousands. The shaft is 700 feet deep.

The Production of Lead.

Mr. Julius Matton "estimates the world's production of lead for the year 1893 as follows, in metric tons: Spain, 187,978; United States, 177,770; Germany, 94,191; Australia, 66,046; Mexico, 40,644; England, 36,070; Italy, 19,920; Greece, 35,241; Austria-Hungary, 10,161; France, 6605; Turkey, 1061; Japan, 914; Sweden, 762; Russia, 610; Canada, 539; other countries, 1896; total, 660,363 metric tons, or 650,000 long tons of 2240 pounds."

The estimate given for the United States is greater by 1829 tons than the amount given for the production of 1893 in the *Mineral Industry*. As we have no reason to change those figures, the total production of the world for the last year should be stated on this estimate at 658,524 metric tons.

If we accept Mr. Matton's estimate as approximately correct, and add to it the figures given in the *Mineral Industry*, we have the following as the world's output of lead for twelve years past, in metric tons:

1882	407,031	1888	635,341
1883	449,216	1889	595,926
1884	437,224	1890	586,903
1885	435,175	1891	626,686
1886	447,906	1892	645,435
1887	516,194	1893	658,524

This shows an increase in production last year of 13,089 tons, or two per cent over 1892. From 1882 to 1893 the increase was 251,503 tons, or 61.3 per cent. In 1893 the United States furnished 26.7 per cent of the world's production, being exceeded only by Spain with 28.5 per cent of the total.

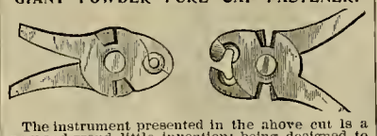
THE *Trade Press* says: "You can publish columns of matter of a complimentary nature about a man's business, and not only will you receive no thanks, but it is looked upon by the subject rather as his due, even though he has never given you a dollar's worth of business—it is 'news,'—'must have something to fill your columns,' he thinks—is 'of interest to readers,' etc., etc. But publish two lines about the business of this same individual which he construes as unfavorable, and the next mail brings a long letter that informs you that you have possibly 'ruined' his business and you receive pointed instructions on how to run a paper."

EVERY ounce of gold that is taken out of the ground adds a measure of wealth to the country. The same is true in a sense, says the Nevada *Herald*, of every cental of wheat. Yet the area upon which wheat may be produced is practically unlimited, while the area that produces gold is very limited indeed. Shall the millions of gold lie unclaimed in the mountains of California because a few acres of farm land may be in some danger of injury from its extraction? If gold could be produced almost anywhere, as wheat can, the question would be a different one; but it cannot. Gold is where you find it; wheat is where you put it.

THE engineer who is installing the electric power plant for the new Metropolitan Elevated Railway in Chicago figures that the use of electricity will save that company $300,000 a year in operating expenses, compared with the cost of running trains by authracite-burning locomotives.

"ELECTROLIER" is displacing "chandelier" in decorative terms.

GIANT POWDER FURE CAP FASTENER.



The instrument presented in the above cut is a new and grand little invention; being designed to save life and limb, and innumerable lawsuits, by doing away with the dangerous operation of digging out wet and unexploded loads where Giant Powder is used in mining. The instrument crimps the cap on the end of the fuse, *firmly* and *absolutely water tight*. There is also a Fuse Cutter attached. They are neatly gotten up, of the finest cast steel, and nickel plated. Price $1.00 each.

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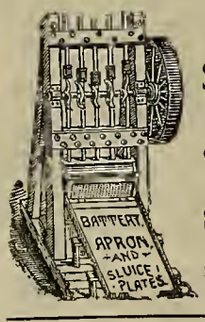

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Market Reports.

The Markets.

SAN FRANCISCO, Aug. 23, 1894.

Silver at 66 cents is gratifying to those who have regretfully noted its steady depreciation. To-day's quotations are the highest since the 5th of last February. London financiers say it will go to 33d. The Chinese war is given as the prime cause for silver's upward movement, China being reported negotiating a £1,500,000 loan, of which £1,000,000 is payable to China in silver. London speculators are dealing in futures on silver, and the impression is that silver will not stop at present quotations. The Orient is still attesting its absorbent qualities. In peace or war that quarter of the world takes in silver constantly, and never returns it. Up to July 12th, shipments of fine silver from London to China aggregated in value £1,837,054; for the same period last year the aggregate was £324,903—this year's, so far, being more than five times what it was in the corresponding period in '93. It is reported in London to-day that the Indian mints are going to coin a British trade dollar to take the place of a Mexican dollar. They will find it slow work.

The Gorman tariff bill goes into effect at 1 P. M. next Monday, except that part which makes wool free, which event will take place January 1, '95. California's concern in it has been thoroughly discussed. In addition to the list given last week, the following shows some of the principal changes:

	Gorman Bill.	McKinley Bill.
Boracic acid, ₱ lb	$ 03	$ 05
Borax	02	03
Quicksilver	07	10
Coal	40	75
Iron ore	40	75
Iron, pig or scrap	4 00	6 00

New York Prices.

NEW YORK, Aug. 23.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	29¼	63½	....	....	....
Friday	29¼	63½	9 12½	3 15	19 50
Saturday	29¼	63½	9 15	3 15	....
Monday	29½	64	....	....	....
Tuesday	29¾	64¾	9 12½	3 15	19 50
Wednesday	30¼	65¾	....	....	....

The local hullion, money and exchange quotations current are as follows:

Drafts on Sight, New York, per $100	12½c
Drafts on New York, Telegraphic	15c
Sterling Bills on London, 60-day Bank	$4.86¾
Sterling Bills on London, Sight	$4.87¾
Sterling Bills on London, Commercial	$4.86¼
Silver Bars, per ounce	65¾@65⅞
Mexican Dollars	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	12
BORAX.			
Refined, in car lots	—	@	8½
Powdered, "	—	@	8¾
Concentrated, "	—	@	7½
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, johhing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	17 00
ZINC.			
Sheet	8½@		9
LEAD.			
Pig	—	@	4¼
Bar	—	@	4½
Sheet	—	@	5¾
Pipe	—	@	5½
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 95
Drop, B and *larger* sizes, " "			2 10
Buck, Balls and Chilled, do, " "			2 10
QUICKSILVER.			
Home trade, per flask	35 87½@		36 00
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	21	@	22
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 75
Coos Bay			5 50
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 25
West Hartley			8 25
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 75	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 00	@	— —
Egg, hard	9 00	@	— —
West Hartley	8 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

—Tho steamer China from Hongkong and Yokohama arrived here last Saturday, making the run in eleven days and eighteen hours, breaking all previous trans-Pacific records. The trip was also remarkable in the fact that no Chinese passengers were aboard.

—The values of the lumber shipments from Puget Sound, foreign, for April, May and June '94 were: Lumber, $183,657; lath, $1157; pickets, $2888; shingles, $1495. Total, $189,187.

Mining Share Market.

SAN FRANCISCO, August 23, 1894.

The Comstocks were firm throughout the week, and the shorts were not particularly happy over the prospect. The ore in the 1700-foot level of the Con. Cal. & Va. gives an assay of $100 a ton, and it is expected by Saturday next the Mexican mill will begin crushing Crown Point ore. A Con. Cal. & Va. dividend is among next month's possibilities. It would have the added charm of novelty.

The following illustrates the changes of the week:

MINES.	16	23
Utah	$ 08	$ 09
Sierra Nevada	71	93
Union	72	69
Mexican	1 35	1 20
Ophir	2 55	2 30
Consolidated California and Virginia	4 70	4 30
Best & Belcher	1 55	1 35
Gould & Curry	65	58
Savage	41	36
Hale & Norcross	70	64
Challar	31	27
Potosi	48	43
Bullion	17	.....
Exchequer	.....	.....
Alpha	.....	.....
Confidence	.....	1 05
Yellow Jacket	54	47
Crown Point	73	78
Belcher	92	86
Overman	14	23
Justice	20	24
Alta Consolidated	23	21
Consolidated New York	.....	.....
Challenge	.....	.....
Bodie	1 70	1 65
Andes	57	52

San Francisco Stock Board Sales.

SAN FRANCISCO, Aug. 23, 1894.

FIRST SESSION—9:30 A. M.

100 Alta	21	300 Gould & Curry	58
100 Belcher	86	200 Justice	24
900 Bodie	1 65	100	23
100	1 60	100 Mexican	1 20
400 Best & Belcher	1 35	400	1 15
100 Bulwer	23	250 Ophir	2 30
950 Con Cal & Va	4 25	100 Potosi	43
250	4 30	300 Savage	36
200 Challar	27	350 Sierra Nevada	93
200 Crown Point	78	50 Union	67
200	77	300 Yellow Jacket	47

SECOND SESSION—2:30 P. M.

300 Andes	52	150 Ophir	2 20
300 Belcher	86	600 Overman	23
200 Best & Belcher	1 30	100 Savage	35
550 Bodie	1 55	300 Seg Belcher	15
1200 C. C. & Va	4 25	100 Sierra Nevada	91
100	4 30	250	92
100 Confidence	1 05	100 Union	69
300 Crown Point	75	100 Utah	09
100 Hale & Norcross	64	100 Yellow Jacket	46
100 Mexican	1 15		

Coast Industrial Notes.

—Riverside wants to own a $20,000 electric light plant.

—Large numbers of Italians are returning home from this State.

—Over 250 negro miners have been imported to the coal mines at Roslyn, Wash., to take the places of the strikers.

—Petroleum is reported discovered at Mill Valley, Marin county. Three wells are to be bored and the region thoroughly exploited.

—The annual report of the San Francisco City Hall Commissioners shows that up to July 1, 1894, the hall had cost $5,279,582.30.

—The United Railroad Company has incorporated with a capital of $5,000,000. It purposes building a railroad up the San Joaquin valley from Stockton to Bakersfield.

—The board of directors of the Modesto Irrigation District have let the contract to the San Francisco Bridge Company for $65,000 to construct head gates, flumes and waste gates on the Modesto canal.

—From Portland, Or., is announced a reduction in the wages of Oregon Railway and Navigation Company employes of twelve and one-half per cent on all drawing over $100 a month, and ten per cent on all drawing over $50, to and including $100.

—Isaac Trumbo, who is here, says his project for building a railroad from Salt Lake, Utah, to Los Angeles is going ahead. He says that road can supply cheap coal from Utah, hituminous, cokiug and anthracite. "in unlimited quantities and at prices that will enable our manufactures to compete in the markets of the world with those of the East."

—With apparent ease the new hattle ship Oregon showed a rate of speed of eighteen knots on her preliminary trial trip last Wednesday. Should this rate be repeated at her coming official trial (and there is no reason to believe that it cannot), the Union Iron Works will earn a handsome honus for every quarter knot in excess of the required fifteen knots an hour.

—The hronze foundry of Messrs. White & De Rome, in this city, is attracting considerable attention hy the fine quality of its work. Some fine pieces of their work were at the Midwinter Fair. They are now casting the statuary for the Lick monument, the most recent piece being an 1800-pound casting, representing the prow of the vessel on which the figure of Commerce appears. This is believed to he the largest and most expensive hronze casting ever made in this country west of St. Louis.

—"The fall of 1895 will see boats passing through the locks at the Cascades, Oregon," says Mr. J. G. Day, the contractor having the completion of the great work in charge. Ahout 200 men are now employed on the works, and it is expected that steady labor will he afforded to a much larger force during the next eight months without interruption. A good deal of delay was encountered on account of the flood, hut the real damage sustained did not amount to a great deal and will not seriously affect the main work. The upper canal has been pumped out, and the masonry work has commenced on the main part of the locks. Had it not heen for the new dam, or upper hulkhead, work would have been still longer delayed, hut now it is fairly under way to accomplish as much as possible before the next high water comes. Unless there is some unexpected delay, Contractor Day is certain that the locks will he ready for operation hefore January 1, 1896, and the most stupendous picce of engineering work on the Pacific coast accomplished after working nearly twenty years.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 14, 1894.

524,479.—SHINGLE PACKAGE—M. J. Carkeek, Seattle, Wash.

524,666.—ARTESIAN WELL—F. Cavallaro, San Jose, Cal.

524,631.—SASH HOLDER—Thos. Chope, S. F.

524,667.—LAMP HEATER—A. H. Cowan, S. F.

524,417.—BEVEL AND SQUARE—T. Fahey, Spokane, Wash.

524,545.—FILTER—B. F. Field, Los Angeles, Cal.

524,500.—PROPELLER—S. G. Hinds, S. F.

524,553.—HOISTING APPARATUS—C. C. Kinsman, S. F.

524,561.—CULTIVATOR—Jas. Porteous, Fresno, Cal.

524,562.—RAISIN GRADER—Jas. Porteous, Fresno, Cal.

524,687.—BURNING CITY REFUSE—E. L. Ransome, Oakland, Cal.

524,688.—TREATING CITY REFUSE—E. L. Ransome, Oakland, Cal.

524,669.—CHIN CHECK — Thos. Raymond, Walla Walla, Wash.

524,504.—FRUIT BOX—G. C. Richards, S. F.

524,671.—TIME PIECE WINDER—H. Schumacher, S. F.

524,490.—WAVE MOTOR—Singer & Wood, Los Angeles, Cal.

524,567.—AMMONIA PURIFIER—R. G. Sneath, S. F.

524,656.—STORAGE BATTERY—B. C. Van Emon, S. F.

524,568.—FRUIT CARRIER—E. E. Wade, S. F.

624,624.—PROPELLER—Welch & Lovell, Astoria, Or.

524,496.—WORD REGISTER—J. E. Withrow, Los Angeles, Cal.

524,625.—FRUIT CARRIER—J. B. Wollard, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CULTIVATOR.—James Porteous, Fresno, Cal. No. 524,561. Dated Aug. 14, 1894. This implement belongs to the class of vineyard or orchard cultivators. Tbe invention lies in a peculiar and novel rearwardly extending bar attached adjustahly at one end to the lower end of the shank just hehind the shovel, and having its other end turned and adapted, when the whole har is emhedded with the shovel of the cultivator, to lie flat and present a hroad, flat surface within the ground, the object heing to prevent the cultivator from jumping vertically and to guide and steady its movement. This makes it particularly desirahle in vineyards and orchards, where it is necessary to cultivate close to the vines and trees, for in such cases it is of the greatest importance to steady and guide the implement to avoid contact and consequent injury to the vines and trees.

HOISTING APPARATUS.—Chester C. Kinsman, S. F., Cal. No. 524,553. Dated Aug. 14, 1894. This device belongs to that type of hoisting apparatus in which oppositely inclined tracks meet in a crest or apex; upon these tracks a trolley is caused to travel hy means of the main hoistiug rope or runner, and this trolley carries the load. Difficulty has heretofore existed because of one of the inclined tracks having a less inclination than the other; it resulted that the slacking away of the runner when the trolley reached the crest of the track merely had the effect of lowering the loaded tuh while the trolley remained stationary. To avoid this difficulty it was necessary to positively support the loaded tub on its course to the bunker independently of the runner, so that the trolley would move down the gentle incliue. Previous to this apparatus, this was accomplished hy a second trolley traveling on a second track and adapted to receive the load as the first trolley passed the crest of the tracks, hut by this apparatus, by means of a small automatically operating hook or latch, the same result is accomplished and the second trolley and track are wholly dispensed with.

CHIN CHECK FOR HORSES.—Thomas Raymoud, Walla Walla, Wasb. No. 524,669. Dated Aug. 14, 1894. This check comprises a U-shaped side picce, one ou each side of the nose of the horse and lying in substantially an upright position; a strap secured to the bases of these side pieces and passing under the horse's chin; a strap secured to their rear upper extremities and passing over the horse's nose, and a check strap secured to the upper forward extremities of said side pieces. A strain upon the check strap will cause the side pieces to act as levers, so that their rear extremities bear on the nose strap as a fulcrum, whereby the latter is tightened to place and at the same time the chin strap is raised up and tightened in its place. This leverage is a powerful one and so tightens the whole devicc in place that it will act as a complete rest for the horse's head, while uot interfering in any manner with the ordinary driving bit or its connections.

RAISIN-GRADER.—James Portcous, Fresno, Cal. No. 524,562. Dated Aug. 14, 1894. This machine is ono of those in which a vibrating shoe carrying a series of sieves is employed. In graders previous to this, the screens have been connected fixedly with the shoe and have had no other movement than that of the shoe itself. The connection in the present instance between the sieves and the shoe is of such a character that the former have imparted to them an independent movement accompanied by a jar or bump to effect additional agitation or impulse of the material, which, especially in the grading of raisins, is of great advantage in that it prevents the clogging of perforations or meshes of the screen, a tendency which raisins, on account of their gummy character, invariably have. To accomplish this result, the screen is supported loosely upon and secured at one end to the shoe, while its opposite end is free to move in vertical planes, and there are means for limiting the independent movement of the screen to produce a jar or bump.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Delinq't and Sale.*	*Secretary.*
Brunswick Con G M Co, Cal	7	2c	Aug 22, Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7, Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	20c	Aug 9, Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27, Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17, Aug 24, Sept 21	C C Harvey, 309 Montgomery
Osborn Hill G M Co, Cal	3	15c	July 7, Aug 7, Aug 23	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17, Aug 21, Sept 11	G D Edwards, 411 California
Potosi M Co, Nev	42	25c	Aug 2, Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24, Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	20c	July 27, Aug 30, Sept 19	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18, Aug 22, Sept 11	E L Parker, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31, Sept 11, Oct 2	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2, Sept 5, Oct 10	W H Blauvelt

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DEEP WELL PUMPS!

Mineral or Agricultural?

On September 5th. U. S. Register Fraser and Receiver Gardner, at Sacramento, will hear the contest of Messrs. Prado, Weeks, Robinson and Moore, mineral claimants and contestants, against John Dyer, agricultural claimant and respondent.

The contest involves the question as to the mineral or non-mineral character of the southeast quarter of the southeast quarter of section 7, township 16 north, range 9 east, Mount Diablo meridian, in Nevada county. The contestant and witnesses are ordered to appear on the 15th inst. and show whether the land is more valuable for mineral than for agricultural purposes.

On September 20th they will also hear the contest of the Gold Bar Quartz Mining Company, the Central Pacific Railroad Company, Richard Ryan and all other mineral land claimants to the townsite application of Superior Judge Caldwell of Nevada county, in trust for the inhabitants of the townsite.

Judge Caldwell was requested by a number of settlers on the land, which adjoins Grass Valley, to apply for a townsite. The application was opposed by the Gold Bar Company, on the ground that the site is on mineral land. The proposed townsite embraces lot 3 of section 33, lot 6 of section 28, lot 12 of section 27 and the northwest quarter of the northwest quarter of section 34, township 16 north, range 8 east, Mount Diablo meridian.

On September 17th the Register and Receiver will also hear the contest of Samuel Newman, adverse claimant and contestant, vs. Henrietta and Hiram B. Barnes, respondents.

The contest involves mineral lot 37, section 18, township 10 north, range 19 east, Mount Diablo meridian, including the Altura quartz mine located in Alpine county. The contest was brought to determine whether Mrs. Barnes performed the necessary $500 worth of work on the land before she entered it in the Land Office and secured a patent to the land.

A Strong Protest.

The following is from the Grass Valley *Tidings:*

The miners employed in the Empire and North Star mines were informed Monday that their wages are to be reduced, and they were given three days to consider the matter. The wages are to be reduced as follows: Men now receiving $3 per day will hereafter be paid but $2.50; men receiving $2.50 per day will be cut to $2.25; and men now receiving the latter named sum will receive but $2. This means that Grass Valley, the most prosperous and largest mining town in the State, is to be reduced to the level of the dago mining camps of Amador and Calaveras counties. Three dollars a day has always been the prevailing rate of wages paid to miners in this district, and it is now to the interest of the miners and the business men to see that these wages are sustained.

The Nevada *Herald* of the 22d says:

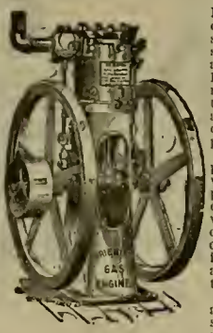
One version of the North Star reduction of wages is, that the men were asked if they were willing to work for the reduced rates, and they were told that if they were not the mine must close down, as it had been losing money for six months; that there was no attempt or intention of making an attempt to enforce the rates if the men objected. It is thought that a yielding of this point would result in making this a $2.50 district.

The men believe that the only way to keep up wages is to stand out against a beginning of a reduction. The matter has caused considerable excitement in Grass Valley.

Gold Quartz Mine For Sale.

A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which ten-dollar rock is now being crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

The Oriental Gas Engine



IS THE BEST because it combines simplicity of construction with power and economy of space. It can be run with natural or manufactured gas or gasoline at a cost of 20 to 25 cents per horse power per day.

It can be used for pumping purposes, as well as for all purposes where a perfect engine is required, with the advantage of lessening the risk of explosions. No licensed engineer at a high salary needed to operate it.

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vo. 6.

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Metallurgists are invited to send for our pamphlet explaining the great merits and economy in use of the

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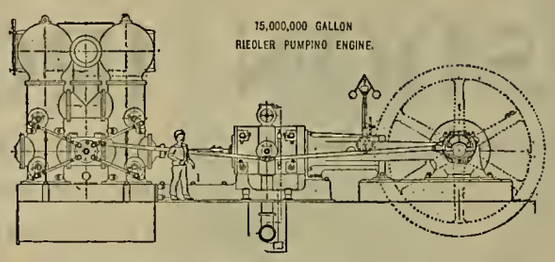
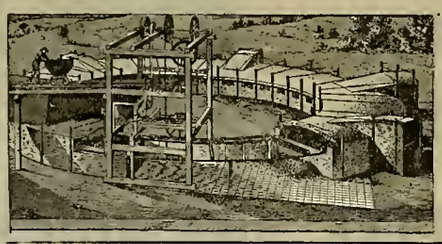


15,000,000 GALLON RIEDLER PUMPING ENGINE.



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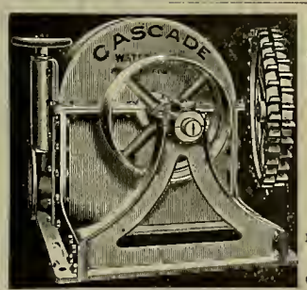
WATCH FOR NEXT WEEK'S AD.



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AND PACIFIC ELECTRICAL REVIEW.

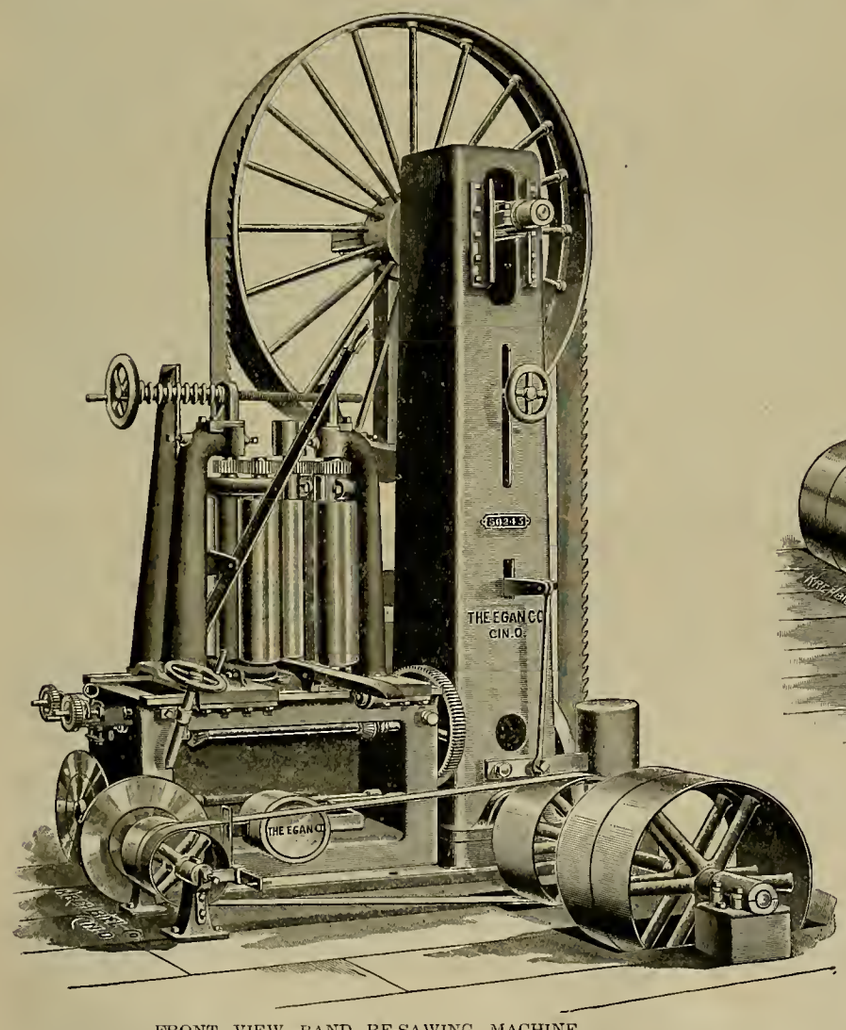
VOLUME LXIX. Number 9. SAN FRANCISCO, SATURDAY, SEPTEMBER 1, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Band Re-sawing Machine.

Herewith are presented a front and a rear view of an improved band re-sawing machine which has a capacity to saw stuff thirty-six inches wide and twelve inches thick. It is, of course, intended for use in large mills where a machine of great capacity is required. Though capable of doing very heavy work, the machine can also do light work, and an improved system of feed gearing—having the two front feed rolls close to the saw-blade, and a tension device connecting the top of roller brackets—enables the machine to straighten the plank while being sawed, making a great saving of time and material.

The wheels are sixty inches in diameter, made entirely of iron, with extra large hubs and steel spokes, placed staggering and perfectly balanced. The lower wheel is made thicker and more solid in the rim and is given thereby increased weight and momentum which much improves the action of the machine. Each wheel is supported by an outside bearing on each side of the column, there being three bearings to both upper and lower shafts. The shafts are of steel, are large in diameter and run in self-oiling boxes. The wheels are so connected to the shafts as to make it impossible for them to get loose or run out of true.

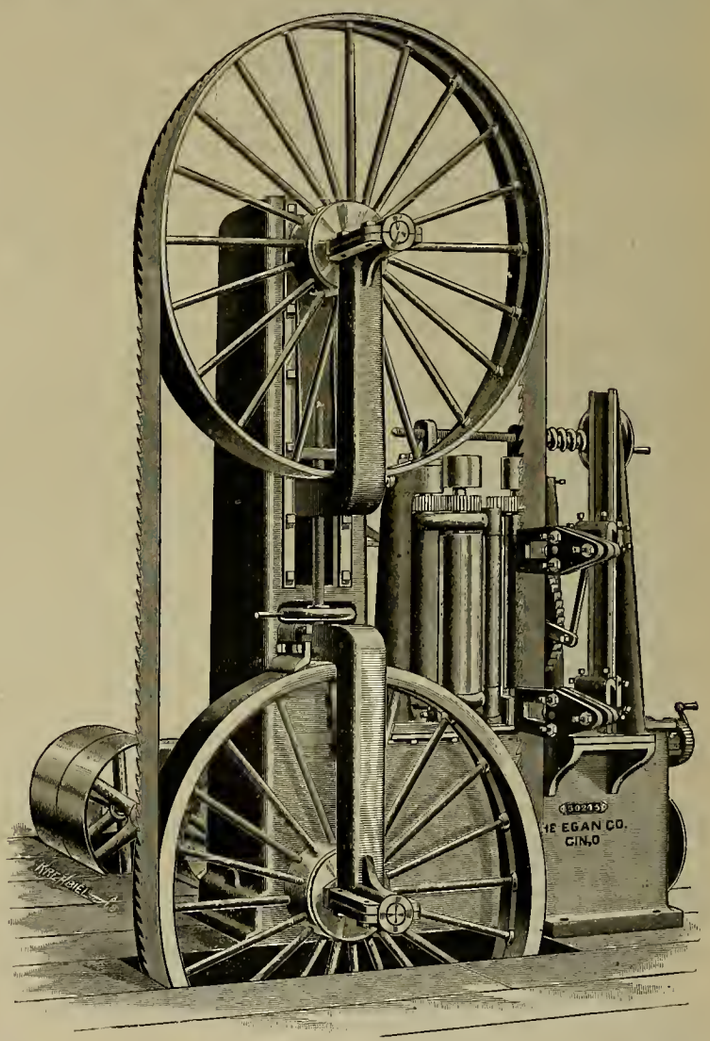
The feed is very powerful, consisting of six large feed rolls heavily geared,



FRONT VIEW BAND RE-SAWING MACHINE.

driven by a friction disk mechanism, enabling the operator to change the speed instantly, by turning a hand-wheel while the board is being fed through the machine. A ratchet lever handy to the operator is connected to the upper guide, made so as to change the guide instantly to suit the width of the board to be cut, and hold the saw-blade steadily in the cut.

Several pieces of narrow stuff can be cut, placed between the rolls one above the other. The rate of feed is from 0 to 100 feet per minute, according to the work being done. For saw mills, large planing mills, box factories, picture-back stock, furniture factories and trunk makers, jobbing shops, etc., the machine is especially recommended. A six-inch saw-blade and all necessary wrenches, etc., are furnished with the machine which is built by the Egan Company, Cincinnati, Ohio.



REAR VIEW BAND RE-SAWING MACHINE.

THE Tasmanian government has made a novel though commendable move in arresting a man for alleged salting of a mine. He tried to dispose of a mine at Mt. Huxley, and after the mining engineer had reported on it the vendor was taken into custody on a charge of conspiracy to defraud.

THE North Star mine, at Mokelumne Hill, will put in a ten-stamp mill. The gravel deposit has hitherto been hydraulicked, but the channel dipped and the deposit will hereafter be milled. About $20,000 has been taken out this year.

THOSE who like the excitement of "rushing" have now a great choice of places to rush to—Western Australia, South Africa, the Phillippine Islands, and now comes news of virgin gold fields of wonderful richness in Chili.

ABOUT seven hundred men are now employed in the mines around and near Telluride, Col. It is thought that in sixty days the number will be increased 300.

MINERS in the Forty-Mile country, Alaska, are reported having a tough time, by reason of the recent hard winter and the scarcity of supplies.

MINING AND SCIENTIFIC PRESS.

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Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, September 1, 1894.

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CHEAP rates prevail between Houston, Texas, and New Orleans, the 362 miles travel costing but twenty-five cents.

THE House bill, putting silver-lead ore on the free list, passed, but was sidetracked in the Senate, the three-fourths of a cent per pound in the Senate bill being the present duty.

ALL the State political parties have made their nominations; the election takes place November 6th. In November '92 the vote stood on Presidential electors: Democrat, 118,151; Republican, 118,027; Populist, 25,311.

THE surveyors now determining the boundary line between Nevada and California are at Genoa. It is reported that they find the new survey cuts off a strip of territory three and one-half miles in width from the south side of Douglas county, Nevada.

THE clerk of Siskiyou Co., Cal., has set his charge for recording a notice of suspension of assessment on mining claims at fifty cents. As the County Mining Association furnishes free blanks, the cost of complying with all legal requirements is commendably light.

ENGLISH EXCHANGES print reports from Mozambique, which indicate that the general era of gold development embraces that far-off territory. The Mozambique gold fields are represented to be rich and easily worked, and, if so, will swell the gold output of '94 to an extent proportional to the energy displayed in their development.

A RECENT alleged congressional enactment is a bill authorizing the taxation of treasury notes by States, counties and municipalities. These notes include greenbacks and other legal tender paper money issued by the Government. The treasury reports place the greenbacks in circulation at $346,000,000. In addition there are $131,000,000 of notes issued for the purchase of silver bullion outstanding.

THE cleverest trade paper in New York says: "No paper with a very large issue ever goes to the expense of printing its title page in two colors." It also says: "A trade journal with a thousand subscribers often has a greater number of readers of the sort the advertiser wishes to appeal to than the daily paper circulating a hundred thousand copies." In the same proportion, a trade journal or technical journal with 5000 paying intelligent subscribers offers better inducements to the advertiser in that line than a daily paper circulating half a million copies.

Black Sand.

At various points along the Pacific coast from Gray's Harbor, Washington, on the north, to Point New Year, thirty miles below San Francisco, on the south, there are found heavy deposits of a heavy black sand, of about the fineness of ordinary beach sand, which contain more or less of finely divided but rather pure gold particles. This is called black sand, from its color, which is usually black, and sometimes iron sand, from the fact that chemically it is mainly iron. The deposits are of two kinds—the old beach sands, meaning those which lie considerably above the present water level, and the new or late sands, which form part of the present beaches, and, like the other beach sands, are moved back and forth by the waves.

The gold-bearing sands along the present beaches are usually black in color and are composed mostly of particles of magnetic iron; that is to say, of the magnetic oxide of iron, called magnetite. In chemical constitution the substance is considered to be a mixture of the protoxide and sesquioxide of iron, having seventy-two parts metallic iron to twenty-eight of oxygen. It is hard, sometimes scratching glass; its specific gravity is about five. It is strongly magnetic and is infusible. It is found in nature disseminated through granite, gneiss, mica slate, syenite, hornblende slate, chlorite slate and limestone, and at other times forms extensive beds of ore suitable for making the finest qualities of iron and steel. It is the same as loadstone or native magnet, excepting that the latter possesses polarity. It is maintained by some that the magnetic ore in the shape of black sand is even better adapted for steel-making than that which occurs in beds. But why this should be so is not explained. With the iron, which usually amounts to half or three-fourths of the whole bulk, there are other substances which may be regarded as impurities. They are first, and most useless and deleterious, titanic iron, called ilmenite, a substance possessing the same hardness, color and specific gravity as magnetite, but of no use in the arts, although it is rich in oxide of iron, and is prejudicial in smelting. Rounded quartz sand forms a varying proportion of the beds, sometimes nearly the whole and sometimes being entirely absent. The gem called zircon, a silicate of zirconium, also exists in the beach sands, and is not rare, though too small to be noticed except mineralogically. These, with other and rarer substances, make up the black sands, with the exception of the contained gold which is supposed to be always free or unincumbered.

During the time that experimenters have been dealing with the problem, a large number of people have been making a living and some few getting rich by working the sands in the simplest and cheapest possible way; namely, by sluicing or rocking. It was in 1852 that the first work of the sort was done; it commenced that year on the California coast at Gold Bluff, near Crescent City, and in Oregon at the beaches at the month of the Rogue and Coquille rivers. Over a thousand miners were engaged in the industry at various points along the Pacific shore in the following years, the most being congregated near the points named, where the sand was richest. Work has been kept up at those localities, and intermittently at many others. No close estimates of the number of miners engaged therein have ever been made, nor of their earnings; but estimates for particular years have often been published. Probably the average number of miners employed steadily at this work would not vary much from 500, taking the years together. There has been a gradual decrease from 1856, when the number was greatest. In that year the coast of Curry and Coos counties was the scene of very active operations, and the former county contained then and for several subsequent years more people than it has at present. Large camps were built up at various points, and some of them remain populated at this day. Randolph, at the mouth of the Coquille, the center of the "high" or old beach mining industry, was the principal camp. Still, the resources of gold are not by any means exhausted, nor are they exhaustible if judged by their present appearances. There is hardly any diminution of riches noticed in the moving sands of the lower beaches, while the high deposits have hardly been touched. Explorations continually reveal more of the latter, and the ocean is continually providing more of the former.

The product of the Pioneer mine in Coos county, Or., was $18,600 in one year.

The most important "old beach" deposits occur about the mouth of the Coquille river, Coos county, where there are beds of many feet in thickness, overlaid usually with barren sand and other debris to a greater or less extent, the principal bed being buried under such a thickness that it would require extensive mining operations to obtain the gold which is known to be disseminated therein. For working a deposit of this kind, a system of drift mining is recommended, whereiu the overlying mass of gravel is supported temporarily by timbering, while the auriferous materials are sluiced out and the gold recovered. An open cut might be run to the sea, in which cut a long line of sluices with riffles should be stationed. Working a block of gravel here several feet in depth, although lying under from twenty to forty feet of worthless material, might be expeditiously and safely performed this way. These deposits have a sameness of description; they lie 30, 60, 100 and even 300 feet above the present beach, and are referable to various periods of elevation of the shore line, probably not, geographically, very ancient in any case.

In Tillamook, Or., a new process has been introduced by which it is claimed that fully ninety per cent of the gold can be saved. The body of black sand is almost unlimited, as it is found nearly everywhere on the ancient beach which extends inland along the Coquille river about two miles and has been traced north and south to a considerable distance. A complete successful process would be hailed with joy all along the coast.

Since the above was in type, the following was noticed in the current number of a Del Norte Co., Cal., paper, published close to a large deposit of this sand, and is here appended as illustrative of hundreds of similar items that have been published in this paper in the last thirty-four years, exemplifying the fact that the industry is a permanently paying one, and that there has been little change in the successful methods of securing the gold:

The black-sand mine of E. Yates, a couple of miles below Crescent City, is running in full blast, and indications are that it is a bonanza. The machine used for saving the fine particles of gold is similar to the "Old Tom," in use for many years in mining along the beaches. In this machine twenty-five square feet of corrugated copper plates are used, the usual mercury being put on. After the sand that contains the gold passes over the plates, it passes over a blanket. Should the plates fail to catch all the gold, the blanket does it. Mr. Yates believes that almost every particle of gold is saved. In a run of fifty hours about $100 was saved. In a run of fifty hours about $100 was saved. The indications are that the other portions of the property are richer than this, as it is among the driftwood that he is now getting his sand.

IN view of the fact that a bill passed a few months ago by Congress instructing the Secretary of the Treasury to coin the silver seigniorage was vetoed by the President, it is interesting to note the present mint activity in the coinage of the seigniorage and also the principal. Mint Director Preston, discoursing on the 423,000 standard silver dollars minted in July, says that the bullion from which these dollars were coined was acquired under the act of July 14, 1890, which is the only bullion held by the Treasury available for the coinage of silver dollars. The cost of the bullion contained in these dollars was $285,-661.75, showing a gain or seigniorage of $137,338.25; consequently, $285,661.75 will be held for the redemption of treasury notes, and $137,338.25 will be used in the payment of the obligations of the Government and will add to the circulating medium to that extent. A much larger amount was coined last month, and it is understood that the millions of silver on hand will be thus speedily put into circulation.

SIX societies in New York and Pennsylvania will send a joint committee to New York next month in a movement to secure new designs for the silver currency, and will then consider the advisability of holding an exhibition of ancient and modern coins, so that the defects in our currency may be demonstrated. The committee will also probably propose to the Government that a change in coin designs be made at regular intervals of ten years, and that each

new set of designs be typical of the preceding decade. The Natural Sculpture Society, which is interested in the movement, has offered prizes of $300 and $200, respectively, for the best and second-best designs for a new dollar, the competition to be held in 1895. These designs will be submitted to Director of the Mint Preston, and by him referred to the Secretary of the Treasury. The Treasury Department has taken no official notice of the proposition of the society, and Mr. Preston has not sanctioned it officially, but expressed very strongly the wish that new designs could be adopted for all the silver coins.

Concentrates.

THE "smelter clearing house" at Denver, Col., is to be abandoned.

THE Orleans mine stamp mill near Grass Valley is in satisfactory operation.

THE Phœnix mine above Sierra City, Cal., is to be fully prospected and developed.

The Angels *Echo* hears that the Bluir mine has been sold for three hundred thousand dollars.

THE Grass Valley Miners' Union has received over 200 new members during the last two weeks.

THE twenty-stamp mill of the Imperial Gold Mining Co. at Kennedy, Nev., started up last Monday.

THE McKillicun mine at North Bloomfield has been bought by Arnold Becker and others of this city.

THE Dower mine at Nevada City has been sold to three San Francisco men, who will develop the property.

THE Gladstone mine at French Gulch, Trinity Co., has satisfied its financial obligations and will resume.

THE gold yield of Cripple Creek, Col., for the first half of last month was at the rate of $8,500,000 per annum.

JOHN H. MURRAY, a miner, fell 500 feet down a shaft in the Bell of Butte mine last Saturday and was instantly killed.

THE Consolidated California & Virginia mine shipped to the Carson Mint bullion to the value of $107,329.42 during August.

OWING to the low grade of ore, the mill at Cargo Muchacho, Cal., has closed down and operations are confined to prospecting the mine.

GRANT COUNTY, NEW MEXICO, according to the Silver City *Enterprise*, last year produced silver to the value of $1,111,037.47.

THE Harmony Gravel Mining Company, Nevada county, Cal., has levied an assessment of ten cents a share, delinquent September 24th.

THE plaintiff in the suit of the Wyoming Company vs. Champion Company in the United States Circuit Court has filed its bill of costs, amounting to $12,316.02.

THE Houston copper mines, Custer, Montana, have been leased by W. A. Clark & Co., of Butte City, and will be worked by a large force this fall and winter.

A DENVER company is trying to turn the Rio Grande river near Durango, Col., to clean up the gold believed to be in the river bed. A canal has been dug, and a dam is building.

FOR the year ending June 30, '94, the Anaconda, Mont., Copper Mining Co. reports its gross receipts to be $11,131,731 and its expenses $8,303,642, leaving a profit of $2,828,089.

THE July report of the Alaska-Treadwell Mining Company shows that 20,271 tons ore were crushed, averaging $3.21 per ton, a shipment of $65,085 in gold to this city resulting therefrom.

COCHITI, New Mexico, claims to have a dozen mines that give assays of more than $100 per ton on an average, from veins that vary in thickness from five to seventy-five feet. It is a great boast.

THE shaft house at the Amethyst mine at Creede, Col., caught fire last Saturday, and the iron cage, heated red hot, fell to the bottom of the shaft, killing four men who were coming up on the ladders.

A COLORADO mining paper confidently asserts that with the new and improved methods of mining, it is thought that it will cost less than twenty-two cents on the dollar this year to mine gold in Colorado.

THE case of Edward Chandler vs. the West Con. Virginia and California Mining Company, asking for wages amounting to $1057, was decided last Wednesday by Judge Rising in Virginia City in favor of defendants.

THE Electric Placer Mining Company has incorporated in this city. Capital stock, $1,000,000, with S. M. Losch of Auburn, and J. R. Kendall, P. T. Burrell, E. A. Trefethen and A. R. Vining of Oakland as directors.

THE Kennedy, Nev., *New Era* says: Chinamen from American Canyon are coming into Kennedy on foot by way of Cinnahar Summit. They have been engaged by white men to work placer ground in and about Kennedy.

LAST SATURDAY the Centennial-Eureka Company of Utah declared dividend No. 56 of 50 cents per share, aggregating $15,000. Within a period of fifty-six months this property has paid a total of $840,000 in dividends, or $28 per share.

THE Great Northern Railway system has been divided into three divisions, a general superintendent being placed in charge of each, and the general superintendency as it has existed being abolished, involving several official changes.

THE Marion Gold Mining, Milling and Prospecting Company is organized at Rapid, South Dakota, with a capital stock of $300,000. The company will operate the Marion group of gold mines situated on Elephant gulch, four miles west of Custer City.

OWNERSHIP of the Rose Hill mine, on Winchester Hill, near Grass Valley, has been transferred to Messrs. Parker, Wishart & Moody, who are now getting machinery in this city to develop the property, which has paid well so far as worked.

RECENT Alaska reports say much excitement is reported in the Yukon river region over rich gold discoveries. More than 1000 men are said to be in that region engaged in gold placer mining, and $100,000 in gold is at Juneau awaiting shipment to this city.

COSCA, GARCIA & Co. work a new mine near the Colorado mine, Mexico, called the Zaragoza, and believe that the work begun will at a certain depth encounter the famous vein of "Colorado" from which millions of dollars have been extracted by the owners.

THE most costly of all metals, save only gallium, which is worth $3000 an ounce, is germanium, which is quoted at $1125 an ounce. Rhodium is worth $112.50 an ounce; ruthenium, $90 an ounce; iridium, $37.50 an ounce; osium, $26 an ounce, and palladium, $26 an ounce.

ALL work has been suspended in stopes 21, 22 and 23 of the North Star mine at Grass Valley. The work now being carried on at the old mine is in the 2000 intermediate, west. Eighty men and boys working in the mine have been laid off; only twenty men are now at work.

THREE evangelists recently held a revival meeting in the Ontario mine, Scranton, Pa., at the bottom of the shaft. Slips of paper with the words of hymns printed upon them were handed around, and the miners, gathered in the gloom of the mine, joined heartily in the service of song.

Ores and Metals says nearly every mine of consequence in Ouray county, Col., is now being worked. There seems to be a belief that silver has reached its lowest point and from now on will take an upward turn. Many of the silver mines in Ouray county, however, are so rich that they can produce silver at sixty cents, and therefore they will be worked.

THIRTY-SEVEN miners were killed last Saturday by a fire in the Franklin, Wash., coal mine. The verdict of the coroner's jury on the bodies of the miners states that the fire was caused by the act of some malicious incendiary. This is a surprise to those not directly interested, and seems to be based on the fact that the fire could not be explained in any other way.

A SYNDICATE of Colorado and Wyoming mining men will develop the copper deposits discovered last fall on Gold and Mill creeks in Sweetwater county. The lead is 140 feet in width and lies between well defined walls. Assays show that the ore contains copper, gold and silver, some of it running as high as $100 to the ton. The syndicate will put in a forty-ton smelter.

THE Mexican Gold and Silver Recovery Co., of Loudon and Mexico, are entertaining the proposition of establishing a plant for the reduction of gold and silver ore by the cyanide process at Nogales, Arizona. J. H. Palmer, the agent of the company, went to Hermosillo, Mexico, a few weeks ago to erect a plant there, but not being entirely satisfied, will recommend Nogales instead.

THE Dayton, Nev., *Times* says that there is a large deposit of silica in Lyon county, near Clifton. San Francisco men have been to see if it was fit for their use—that of covering steam pipes, etc. It was decided to be the right kind of composition, and a carload of the material is now being taken out for shipment to this city. There is a mountain of the stuff, and it ranges in value from $15 to $25 per ton, according to its purity.

THE Idaho *World* says a cleanup was recently made at the Boulder, after crushing 126 tons. The yield was $5000—over $41 a ton. The ore that was milled was about fifty per cent iron sulphurets. These sulphurets run high. The tailings are held in tanks and a reservoir, and will at some future time be worked by the cyanide process. The Boulder has one vein of solid sulphurets, two feet wide, that assays $140 per ton.

THE Calumet & Hecla copper mine has what is considered to be the biggest hoisting engine ever built. The shaft in which it works is claimed to be 7400 feet deep; the engine is large enough to hoist from a depth of 6000 feet. The drum consists of a double cone, with the greatest diameter in the center and tapering toward each end, the smallest diameter being 13 feet 9 inches, the greatest diameter 36 feet, and distance across the face of both cones 24½ feet.

THE new Nez Perces Indian treaty law carries $1,668,622; $668,622 is to be paid as soon as the department can arrange the necessary details. Representative Sweet of Idaho says the work is progressing rapidly. The Division of Accounts is preparing a list of those entitled to payment under the agreement. Land will be opened for settlement by proclamation of the President in ample time. Agricultural land is to be sold at $3.75 per acre, and mineral, stone and timber lands at $5 per acre.

THE Redding *Free Press* says the Kosciusko Mining Co. is meeting with grand success with the old Quartz Hill mine. Four hundred tons of quartz have been worked by the free-milling process in the Calumet mill, and the daily product is about forty ounces in gold. Quartz Hill is a mountain of ore, which can be quarried out at small expense, and by a railroad the ore is taken to the mill on the river bank, which is run by water power. The ore is of low grade, but the facilities for mining and working are such that the cost of production is not great.

THE Empire Mining Company incorporated in this city last Wednesday to work the Empire mine, situated in Shasta county, and other mines; to extract and mill ores; to acquire and sell mines and water rights, and to erect and operate mills and reduction works. The capital stock is fixed at $250,000, divided into 50,000 shares at a par value of $5 each. The entire amount of stock has been taken up by the following, who are also the directors: John H. Morton, $62,500; W. B. King, $62,450; Grace V. King, $50; Alameda L. Bell, $124,750; Henry H. Bell, $250.

IN more ways than one, says the Australian *Mining Standard*, South Africa presents striking examples of mining enterprise. The latest is in the direction of the amalgamation of gronps of mines into single self-contained concerns with the view of conducting operations upon an enormous scale. There are several combinations of this character, and others are projected. The almost illimitable low-grade ore deposits of the Witwatersrand and other fields can only be made to yield profits by the employment of huge capital and the centralization of power and machinery. South African financiers are fully alive to the necessity for progressive measures; they are dominated by enterprise; the mere bigness is not likely to stand in the way of the consummation of their schemes.

TALKING of Comstock matters, the Virginia *Enterprise* says: Work has been abandoned on the 1000 level of the Con. Cal. & Virginia mine, which is being worked through the old Con. Virginia shaft. The only work which yet remains to be performed there is bringing out tools, car track, pipe, etc. This is the level where Rule did his famous contract work, which was continued by the Con. Virginia Company after his contract had expired. Neither Rule nor the mine-owners struck anything of a paying nature, although the indications promised better results. Sixteen men, whose wages augment the pay roll $2000 every month, will be thrown out of employment by this move, unless, as reported, they are retained and put to work on the recently discovered ore body on the 1650 level. A sinking engine was recently put in on the winze from the Central tunnel in Ophir croppings, and it is said that more men are to be put to work at that point. The winze is being cleaned out and repaired at present. This renewal of attention to the Ophir is hailed with delight by Comstockers.

THE Nevada State Republican Convention last Monday adopted a platform in which is said "the silver question is regarded as the most important before the people to-day. Its demonetization increased the burden of all debts and enriched the creditor classes at the expense of everybody else. It paralyzed the productive energies of the entire country, depressed business of every kind except that of money lending, and there can be no permanent return of prosperity to our country until silver shall have been restored to its full use and highest position as a money metal. The free and unlimited coinage of both gold and silver at a ratio of sixteen to one, with full legal tender functions to each and no discrimination against either, is demanded. This action is asked of the United States actiug independently and wholly regardless of what any other nation may or may not do."

CONSIDERABLE work is being done on the Daggett and El Dorado ditches and flumes in El Dorado county. The Daggett ditch heads in Pilot creek a short distance below the El Dorado ditch, and will be finished to Mount Gregory in two weeks. It is twenty miles long, two miles of which are flumes four feet wide and thirty inches deep. The work is being done by the San Francisco Bridge Company. Next season a 1300-foot tunnel will be driven, shortening the ditch two miles, thus overcoming the dangerous slides experienced nearly every winter. The capacity of the ditch is 2500 inches. The grade of the flumes is five-tenths and that of the ditch three-tenths of an inch to the rod. Mr. Daggett has already expended about $100,000 upon this ditch. He will extend it to the Rubicon next year, a distance of twenty-two miles from its present head in Pilot creek. This ditch will be about 1125 feet lower in altitude than the main ditch of the California Water Company at the nearest point. The Rubicon watershed covers an immense area of territory in both Placer and El Dorado counties. Several small lakes lie within this basin, and natural advantages for immense storage are said to exist. It will require several hundred thousand dollars to carry out Mr. Daggett's scheme to secure a supply of water during the latter two months of the dry season, adequate to San Francisco's wants, independent of the expense of conveying it there after it reaches Pilot creek. There is no confliction or even competition, so far as we are able to learn, between this enterprise and the California Water Company, and even if there was, it is to the interest of the public that it be fully carried out. If the Rubicon ditch is ever completed, the line of the main canal will be constructed down the divide through Georgetown. There will be a demand for all the water it is possible for both canals to supply. The El Dorado ditch, the property of the California Water Company, extends from the junction of Mutton canyon with Pilot creek for a distance of about thirty miles to the company's main canal, a few miles above Georgetown. The upper portion of this ditch has been idle for the past few years, but the company have resumed work and will undoubtedly have the water of Pilot creek running in their main canal by November 1st, thus retaining all legal rights to their share of the waters of Pilot creek. The work is progressing rapidly. There will be about two miles of flume, three feet wide by eighteen inches deep, calculated to carry 400 inches of water, all that Pilot creek affords at low water, the entire flow now not exceeding 500 inches. This ditch also covers the mines of Mount Gregory ridge and Volcanoville.

Personal.

STATE DEBRIS COMMISSIONER KIDDER is in the city.

DENVER WAGGONER is now superintendent of the Uno mine, Amador county.

WILLARD GARDINER is the newly elected superintendent of the Granite Hill mine, Grass Valley.

W. G. STEGMAN has assumed charge of the assay department of the Confidence M. & M. Company at Whitewater, New Mexico.

E. R. ABADIE has resigned the superintendency of the North Star mine at Grass Valley, and has accepted a responsible position in South Africa.

C. M. GORHAM retired from the office of coiner in the U. S. Mint in this city yesterday, which position he has held for twelve years. During his incumbency he turned out $273,000,000 in gold and $39,000,000 in silver. The mechanical wastage during his time has been only 4½ per cent of the allowance permitted by law. Mr. A. T. Spotts is his successor.

GEORGE H. ELDRIDGE, geologist of the United States Geological Survey, has inaugurated the work of making a geological survey of Idaho in accordance with the plans recently promulgated by the director. He has a party on the headwaters of the Clearwater. It is the purpose this fall to make a hasty reconnoisance of the State so as to secure a general idea of the work needed. He will make a report to the department of the results of this preliminary survey, and during the winter plans for detailed work will be formulated.

Obituary.

Henry Schmiedell, the last surviving charter member of the San Francisco Stock Exchange, died last Saturday. In the big bonanza days he made a fortune in the mining stock brokerage business in this city and made many life-long friends.

Mr. Jno. F. Lohse, secretary of the California Powder Works, died in this city last Monday in the 70th year of his age. He was a '49er, and for many years had active part in the mining industries of this coast.

Methods of Mine Timbering.

NUMBER II.

SHAFTS.—Working shafts, as well as tunnels and drifts, should be arranged with a view to securing their permanency. Indeed, in consideration of future possibilities, even greater care should be exercised in the seleetion of their location and in deciding upon their size, while the manner of timbering is most important. Working shafts should be so equipped as to remain open and be in use as long as ore remains in the mine which it will pay to extract. As in all other mine work, the amount of timber required depends largely on the size of the shaft and more particularly on the character of the rock through which it passes. Prospecting shafts are sometimes sunk in good-standing ground to the depth of several hundred feet without other timber than a few stulls, to which ladders are secured. The few timbers thus placed ofteu become insecure through neglect, particularly in regions where there are climatic alternations of wet and dry. When wet, the timbers and the wedges securing them swell. With the change to dryness they shriuk aud are likely to drop out. An additional danger results when the rock walls crumble, and men working below are in constant danger from falling rocks and timbers. The wedges demand frequent attention, for they must be kept driven well in at all times. Ou the desert and in mines above timber line, where timber is expeusive, miners endeavor to get along with as little as possible and are not very particular as to the kind and quality of that which is used. It would perhaps be a better plan to dispense with timber altogether than to place too much dependence on sticks that are likely to drop out of position unexpectedly. As a matter fact, the writer has seen shafts in the Mojave desert mines more than 200 feet in depth without a single stick of timber. The necessities of the case in sparsely timbered regions and on the desert have obliged the miner to resort to many novel plans to protect himself agaiust danger at the least possible expense. He puts in as substantial a frame of timbers as he can obtain, or as he may think he can afford, using a few frail saplings, thin, split lagging, or even brush, to support the sides of his shaft. Fortunately for him, in the desert regions, where scarcity of timber forces upon him this economical "system" of timbering, the rock, being nearly always dry, stands fairly well, as a rule, and expensive timbering is not necessary.

The extremities to which prospectors are often reduced to procure timber in these timberless regions has resulted in the adoption of a method peculiar to such districts. While the result is not particularly pleasing from a workmanlike standpoint, it uevertheless exemplifies most faithfully those principles which are the foundation of the most elaborate system of timbering. In these shafts all timbers are stulls, each one being placed to support some particular rock or mass which seemingly threatens to fall. Each stick is independent of the others; there are uo superfluous timbers, and no attempt at system or regularity. As a result these sticks cross the shaft at mauy angles. Some are horizontal, but most of them inclined somewhat from that position. It sometimes gives the shaft timbers a spiral appearance as viewed from above. Despite the fact that these timbers are placed so much at variance with recognized methods, if placed at the time of making the excavation, or shortly thereafter, and are properly and firmly wedged, they usually render the shaft fairly safe. In that regiou old redwood railway ties are very frequently used for mine timbers, and answer admirably, even though unsuited for such use from having lain for months in a railroad bed, being split and often cut by the rails. The miners are glad to get them, poor as the timber is, for when once properly placed they have been found to do very well, when the pressure is not too great.

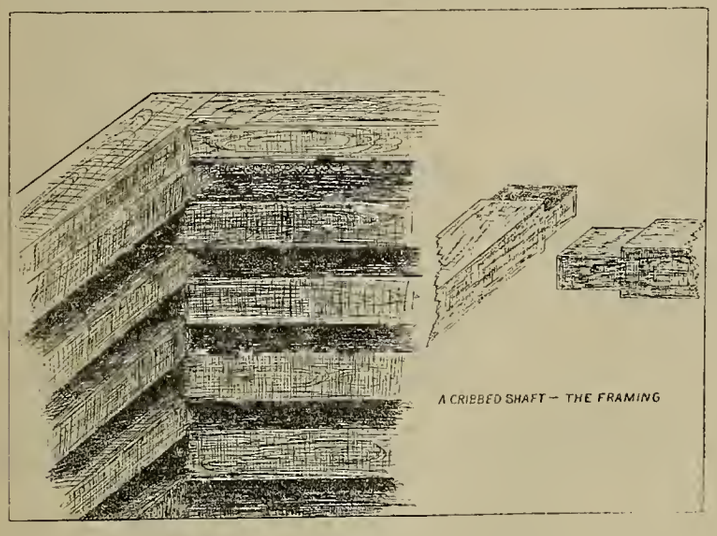


FIG. 14 B.

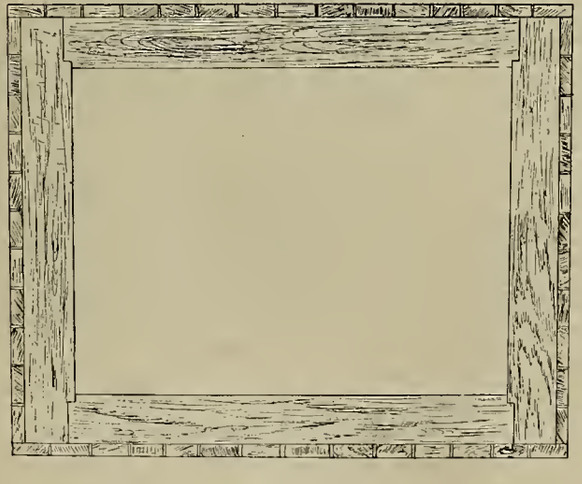
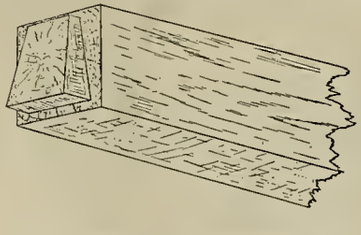


FIG. 14 C.



MANNER OF FRAMING DIVIDER

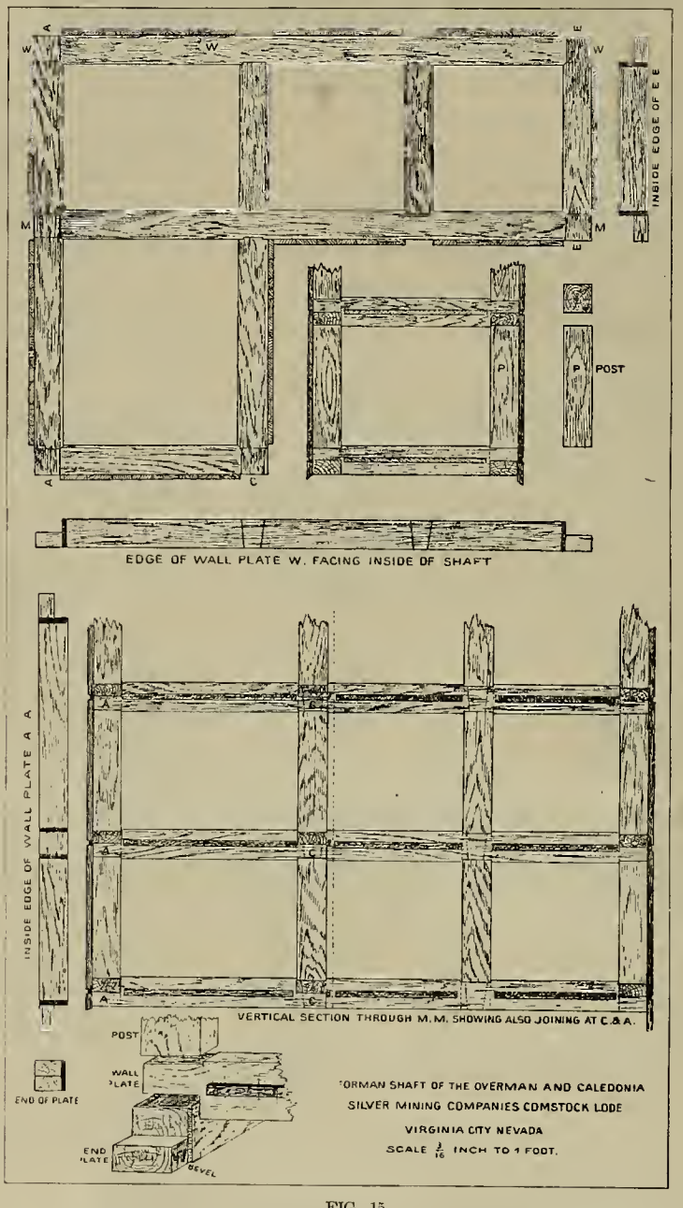

INSIDE EDGE OF E E
POST
EDGE OF WALL PLATE W. FACING INSIDE OF SHAFT
INSIDE EDGE OF WALL PLATE A A
VERTICAL SECTION THROUGH M.M. SHOWING ALSO JOINING AT C & A.
POST
WALL PLATE
END OF PLATE
END PLATE
BEVEL
'ORMAN SHAFT OF THE OVERMAN AND CALEDONIA
SILVER MINING COMPANIES COMSTOCK LODE
VIRGINIA CITY NEVADA
SCALE 1/16 INCH TO 1 FOOT.

FIG. 15.

Shafts having a single compartment, such as are frequently seen in small mines, are timbered in a simple manner. The timbers consist of two wall and two end plates and four posts to each set. The method shown in Fig. 14 C is quite common and suited to shafts of moderate size (5x7 in the clear), having a single compartment. The four frame timbers are placed in positiou and tightly wedged, the posts being driven in at the corners. Care must be taken to keep the sets in line. Sets are ordinarily five feet apart from center to center. When the ground is heavy, sets may be placed closer than five feet. They are often only half that distance from center to center.

Lagging, either split or sawed (two-inch plank), is driven in behind the timbers. It is driven one-half to three-quarters of the way down, when the lower ends of the next set below are inserted between the timber and the wall. Later the lagging of the set above is driven down to its proper place.

When the pressure of the ground is very heavy a crib of timbers is built, the timbers being placed one on another with only a notch at the ends to hold them in place. In soft ground it may be necessary to use lagging, even in a cribbed shaft. All open spaces between the walls and the crib or lagging should be filled with broken rock to secure firmness, and to counteract any tendency of the timbers to shift. The manner of framing crib timbers is shown in Fig. 14 B.

When sinking can be carried on somewhat in advance of timbering, it is sometimes the custom, in

firm ground, to place long timbers, called "reachers," across the shaft, the ends resting in niches cut in the walls. These having been firmly placed, the four timbers of the set are laid upon them and firmly wedged, and from the foundation the sets are built upward to the next set of reachers above, a distance of twenty-five to thirty feet. Where the shaft is sunk in country rock, or in a large pillar of ore (the latter to be avoided when possible), the reachers are placed alternately in sets at right angles.

Men working in shafts placing timbers usually work suspended on slings secured to timbers above.

In places where the above described methods of building sets of shaft timbers on reachers is not possible, owing to the soft nature of the rock in which the shaft is sunk, or where it is desirable to run cages to the bottom of the mine, it was formerly the custom to suspend the shaft timbers by ropes in a position as near to that desired as possible, and to then maintain them in that position by driving iron dogs into the timbers, the weight being supported by the set next above, which had previously been supported by wedges. In some cases these dogs were never removed. Many of them may be seen in the older California mines. The dogs were made of round or square iron bars 1x1 inch or 1x1¼ inches, and having the ends turned at right angles. The points were three or four inches in length and sharp. The length of the dog was determined by the distance from center to center to center of the sets.

When the rock was sufficiently firm to admit of the timbers being firmly wedged the dogs were knocked out. Iron dogs or bolts are useless as a means of support when the surrounding rock masses have once firmly settled on the timbers.

A safer and more convenient device has been introduced in later years, in the form of iron bars having a thread at one end and a ring or hook at the other. These go in pairs, their combined length exceeding by six inches the distance from the top of one set to the bottom of the next set beneath. The manner of using these hangers is as follows: A set having been securely wedged in its proper position, the threaded end of the bolt provided with a hook is passed upward through a hole in the plate (bored in all timbers for the purpose), a washer passed over the end of the bolt, and a threaded nut screwed down onto it. A second "locknut" may be used, but is not necessary. A second similar bolt with hook is passed through a hole near the opposite end of the same timber, and also secured with washer and nut. The timber to be placed directly below is suspended by ropes in a position approximating that desired and a bolt having a ring at one end is passed downward through this timber, immediately below that in the timber above, and a similar bolt is passed through the opposite end. Washers and nuts are placed on the ends of these bolts and the rings are caught in the hooks of the bolts above. The nuts may now be turned and the timbers drawn to exactly the position required, when the ropes may be removed. All four of the timbers of this set having been placed in position, and being suspended on the hangers, the posts are slipped in, the nuts tightened still further, and the whole firmly wedged, when the next set below may be put in in like manner. The hangers are left a few days or weeks, and in some instances permanently, but, as previously stated, they are used as a means of support when the weight of the surrounding rock has settled on the timbers.

Where, owing to the soft nature of the ground, it is thought desirable to have the hangers remain in place indefinitely, a bar having a thread at one end and simply turned at a right angle at the other, or having a solid hammered head with a washer, may be used, being passed upward through the bottom timber and then through that above, where the adjustment is made by means of a washer and nut; but as these bars are longer than the distance between sets, their removal is impossible, a set below having once been put in place. There is no question as to the superiority of the bolts having rings and hooks for either temporary or permanent use.

It very frequently occurs that shaft timbers have to be removed and new ones inserted, and is also often necessary to reinforce timbers already in place. This work frequently necessitates the suspension of hoisting through the shaft. The superintendent of the Wildman mine, at Sutter Creek, Amador county, California, having occasion to retimber the shaft between the 500 and 600 levels of the mine, constructed a chute one foot square of two-inch plank in one corner of a compartment of the shaft reaching between these levels. It was built in short sections, each the length of a set of timbers. The work of retimbering was commenced above and carried downward, all of the refuse rock, timber, etc., being dumped into the chute. This material was taken up on the 600 level, dumped into a skip from time to time, and sent to the surface; by this means the work was quickly and safely carried on, sections of the chute being removed to keep pace with the work. By means of this device there was very little delay in operating the skips, and hoisting of ore was continued almost without interruption during the retimbering of that portion of the shaft.

Large shafts are separated into two or more compartments by placing timbers called "dividers" at intermediate points between the end plates. They reach from the wall plate on one side to that on the opposite side of the shaft. These dividers are framed with a short beveled tenon, broader at the top than at the bottom. These tenons fitted exactly into mortices or notches in the wall plates. At each of the four corners of the shaft and between the wall plates, opposite each divider, is placed a post, which is set in a shallow notch or seat cut in the plates. In size the posts may equal that of the plates, or if desired they may be of smaller dimensions. The dividers are made the same depth as the wall plates, but are usually narrower across the upper face.

The dividers separating shafts into two or more compartments may be made most secure by permitting the upper portion of the beveled tenon to extend into the wall plate two or three inches, the bottom portion being let in but one inch. The post setting directly on the divider holds it much more firmly, and the danger of having the dividers knocked out by shots fired directly below is greatly decreased, if not obviated entirely. It not infrequently occurs when dividers are framed so as to set but one inch into the wall plates a heavy blast will tear them out altogether, incurring expense of timber and time, which may be avoided in the manner stated above.

Drawings of two Comstock shafts illustrate the manner of framing and placing timbers in them. One of these is called an "L" shaft, and was sunk by the Overman and Caledonia companies jointly. It is known as the Forman shaft. The other is the Requa shaft, sunk by the Chollar, Norcross and Savage companies. It is a large rectangular shaft having four compartments, and is a splendid example of its kind.

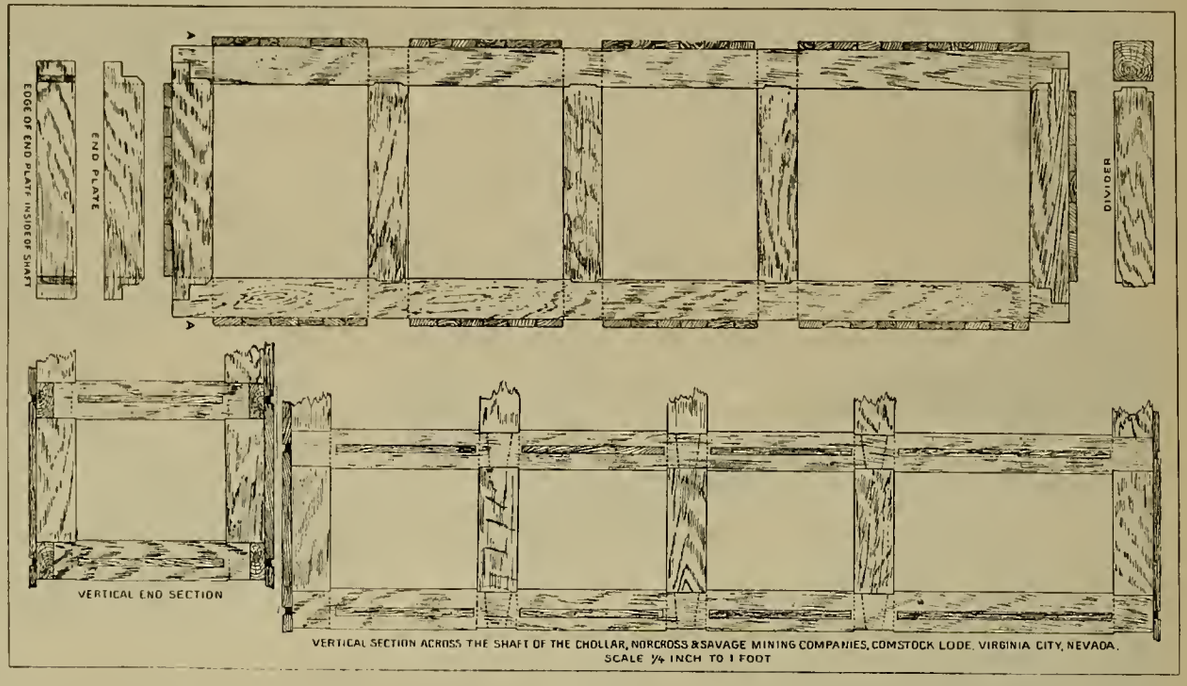
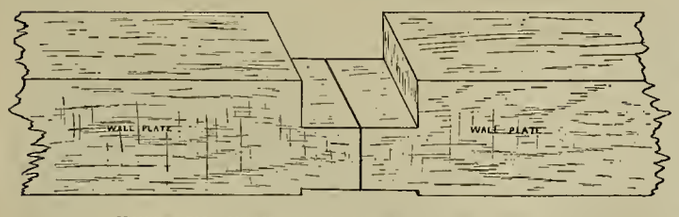

EDGE OF END PLATE INSIDE OF SHAFT
END PLATE
DIVIDER
VERTICAL END SECTION
VERTICAL SECTION ACROSS THE SHAFT OF THE CHOLLAR, NORCROSS & SAVAGE MINING COMPANIES, COMSTOCK LODE, VIRGINIA CITY, NEVADA.
SCALE ¼ INCH TO 1 FOOT

FIG. 15 A.



FRAMING FOR SPLICED WALL PLATE AND OVERLAPPING DIVIDER, FOR SHAFTS.

In size, shaft timbers range from 8x8 to 20x24, and even larger timbers are sometimes employed in very heavy ground, particularly in inclined shafts. The wall plates are usually broader on one side than on the other, and are placed in position with broad side up. End plates are usually the square of the smaller dimension of the wall plate.

Pumping and manway compartments do not require lining, but hoisting compartments, particularly where cages are run, should be lined throughout to prevent accident to men who sometimes overcrowd a cage. There appears to be less danger of this where buckets or skips are used. Every shaft in a mine should be provided with ladder ways as a means of exit in case of accident to shaft or hoisting machinery.

Sinking large shafts in swelling ground, in loose, watery, running ground, or in quicksand, greatly multiplies the difficulties and dangers of the miner. There are instances where shafts have been abandoned owing to insurmountable obstacles which a combination of engineering skill, capital and labor were unable to overcome, but such instances are of rare occurrence. Few shafts present greater difficulties than were encountered at Leadville, Colorado; in the Lake Superior region; in some coal mines; on the Comstock, and in Calaveras and Amador counties, California (the latter are mostly inclines), and some of the shafts in the regions mentioned are today splendid and substantial monuments to American engineering and to the enterprise of the companies owning them.

The shaft of El Capitan mine, Nevada county, now the property of the Providence Mining Company, was sunk through decomposed slate and altered dyke rock under the most trying and dangerous conditions. After several failures, the shaft was carried down to solid ground under the direction of Francis Burns, who worked slowly and carefully, giving the soft running ground time to drain. The water being pumped from the sump, after standing for a time, appeared to drain the ground, and it was found that by this means progress was much more rapid than when the work was hurried. "Breast-boards" were carried down until the dangerous places had been safely passed.

It is sometimes necessary in sinking large shafts to carry them down in sections by driving lagging or planks down in advance of the excavation. This is known as "fore-poling." The section is started at one end of the main opening and advanced several feet, the lagging being well braced. Considerable water will drain to this depression, making the removal of the ground from the remainder of the shaft much easier. By carrying one side of the shaft some-

what in advance of the remainder, in this manner, loose, wet ground can be worked more quickly and at less expense than when it is attempted to carry down the entire shaft at once.

In cases where sinking cannot be carried on in shafts much in advance of timbering, the wall plates may be spliced The better plan is to extend the plate from one side entirely across the two hoisting compartments, that portion in the pumping compartment being in a single piece, and joining the longer piece directly opposite the divider next to the pumping compartment. These joining ends of the two sections of wall plate should be framed so as to permit the divider to lap over their entire width, the upper half of the plate sections being removed so as to admit the upper half of the divider, as shown in the illustration.

The post standing immediately upon the divider, and covering the entire splice and overlap, prevents the divider from being blown out by heavy shots below. This plan also greatly facilitates the placing of shaft timbers, as there is not that great loss of time in getting the wall plates in position, which results when long timbers are handled. There is always difficulty and loss of time where the shaft cannot be carried down in advance of the timbers far enough to give room to turn the long wall plates. This system also permits of the renewal of wall plates and other shaft timbers by the ease with which they may all be removed.

(To be continued.)

The Situation at Grass Valley.

The miners held an enthusiastic meeting Sunday and showed their determination to resist Mr. Hague's attempt to cut down the wages in this county. The *Tidings* says the whole scheme has been hatching for some time. Mr. Hague has lots of property on Rocky Bar Hill and he wants cheap labor to open it up; for this reason he has ordered a reduction to take place at an early date. We are satisfied he will be balked. We understand thirty-two men have been laid off from the North Star mine. There are now so few left that to shut down the mine would be but little loss, and unless he will pay three dollars per day we say shut her down. The fight is not so much against cutting the wages in these two mines, but against establishing a precedent that will result disastrously to all. Let every miner join the Union and thereby strengthen that organization, as well as securing to himself and family a decent living. There are dozens of miners in this city who would be only too glad to lease either of these two mines on the tribute system and show the owners that they will pay, but Mr. Hague would rather close his mine down than do this. Yet he claims that the mines are not paying. Well, perhaps they are not, but that is not saying that they cannot be made to pay. Join the Union and save the reputation of Grass Valley as a fair camp.—Nevada Transcript.

A "Good Send Off" Promised.

Patrick Ragan was "blasted" in the Collamer mine on Tuesday, defective fuse causing a premature explosion. He says: "In a second after I lighted the fuse I saw that I was in for it, and began to scramble out. My foot slipped and I fell as the blast went off. I began to bleed terribly and got weak at once. I don't know how much blood there is in a man, but I think I lost about two gallons." He got out to the point of the hill and hollered lustily. R. T. Pierce fortunately heard him and called for a horse, upon which he placed the injured man and brought him to town, where his wounds were temporarily dressed. A man was started on horseback to summon a doctor, who arrived next morning. Pat is considerably bunged up, but being in perfect health otherwise, he will probably pull through. Though somewhat disfigured, he will be in the ring for a long time to come; but if, unfortunately, he should peg out, we will give him a good send off, such as his friends may be proud of.—Homer Mining Index.

A BIG GIRDER at the Broad-street station, Philadelphia, is 85 ft. long, 10½ ft. high and weighs 110,780 pounds. It is believed to be the heaviest and largest steel girder ever turned out complete by any iron works in the United States. It was made at Pottstown, Pa.

THE Calumet & Hecla Mining Company's latest dividend is $5 per share—half a million dollars. This mine has paid $40,850,000 cash dividends, the largest in amount of any mine outside of Nevada. The par value of the stock is $25, but shares when sold bring $290 each.

THE Colliery Engineer Company of Scranton, Pa., conduct a Correspondence School of Mechanics which, judging from extracts from letters written by students, is in every way a satisfactory success.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XI.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

In 1792, William Murdock of Redruth, Cornwall, England, made experiments with coal, wood, peat, etc., from which he made gas and successfully burned it in his house.

I find it recorded (Chemical News, Vol. XV, March, 1867, folio 109) that during a lecture in the new college of Hackney, England, about 1793, Doctor Priestly put a piece of coal into the bowl of a common tobacco pipe, which he inserted in the fire and ignited the gas, with the remark to his class that he had no doubt that some time this would be turned to an important purpose.

Natural gas—so called—was first discovered in the United States, near Charleston, South Carolina, in the year 1815, but no use was made of it.

As far back as 1817 William Maclure, the pioneer geologist of America, called attention to natural gas on the banks of the Great Kanhawa river in Virginia (Observations on the geology of the United States of America, 1817, folio 57) in the following words: "On the Great Kanhawa near the mouth of Elk river, there is a large mass of black, and I suppose vegetable earth, so soft as to be penetrated by a pole ten or twelve feet deep. Out of the hole so made, frequently issues a stream of hydrogen gas which will burn for some time, and in the vicinity of this place there are constant streams of this gas which, it is said, when once lighted will burn for several weeks. Query: If a careful examination of this place would not throw some light on the formation of coal and other combustible substances found in such abundance in this formation?"

1821.—At Fredonia, New York, a woman went with a lighted lantern at night to a spring for water; an issue of gas, before unknown, ignited with an explosion, to the consternation of the woman. This becoming known, attention was called to the remarkable spring and its emanation of gas. Soon after some was collected in a copper receiver and conveyed in pipes to a mill and several stores, in which it was employed for illumination. This was the first practical use of natural gas in the United States. When in 1824 Lafayette passed through the village, the hotel was brilliantly natural gas lighted in his honor.

1829.—A salt well near Burksville, Kentucky, spouted gas and petroleum, a thing never before known. This phenomenon is more fully described in the history of petroleum.

1859.—At East Liverpool, Ohio, a well sunk for water discharged natural gas in considerable quantity. The eruption of gas and petroleum in Kentucky thirty years before being forgotten, this was a surprise being quite unexpected. It was soon after turned to account and used in the town in manufactories. About this date the town of Bolivar was lighted by open pipes at the street corners.

1861.—Rouse's well was a large producer of petroleum, and much gas flowed with the oil, which is said to have settled in the neighborhood with the appearance of a fog. One day it is said to have exploded and a number of persons were killed.

1864.—About this date there were gas wells at New Cumberland.

1867.—While a well was being sunk within the city limits of Erie, Pennsylvania, a flow of gas occurred which nearly suffocated the workmen. Gas not being sought or desired, the well was filled in and another commenced which produced gas like the first. The importance of this discovery was not realized at the time, but some experiments were made by driving iron tubes deep into the mud and igniting the gas that flowed from them. Mr. Brevillier sunk a well on his premises for petroleum, which failed to flow, but, instead, a gas well was developed from which the precious fuel was allowed to go to waste for three years, after which time he laid pipes to his house and burned it very successfully; only one-sixth of the product of the well was utilized, the rest escaping from a safety valve.

1870.—In October, in Issaquena county, Mississippi, a well was sunk forty feet deep in the so-called bottom or made lands which produced gas very much like that of Stockton in California. The flow was small.

1871.—In February a well was sunk at Buffalo, New York. At 318 feet a vein of natural gas was met with, but the flow was inconsiderable. It was then sunk 312 feet deeper, when salt water was ejected by gas pressure. After pumping for a time, gas flowed freely through a two-inch pipe and burned well, although the light produced was inferior. In burning in the gas works for fuel, it was found necessary to use coke with it.

The average depth of gas wells in Erie, Pennsylvania, was 600 feet, the average cost $1500, and the yield from 10,000 to 20,000 cubic feet daily. The gas was used for fuel and lighting to great advantage. Senator Lowry of Erie from a private well supplied fourteen fires in his dwelling and the chandeliers in the different rooms, besides which he warmed the cellar, used as a laundry.

A well sunk in Painesville, Ohio, only 550 feet deep, yielded "an enormous volume of gas." During this year the average price of coal delivered in Pittsburg was $2 per ton.

The city of Erie was lighted by natural gas. One well put down by the city gas company flowed 24,000 cubic feet daily.

Near the mouth of the river Hockhocking, Ohio, at the depth of 600 feet, a crevice was struck in a well being sunk, from which issued a stream of gas "unparalleled in all the oil explorations in the country." This well gave out also salt water and oil intermittantly, the gas throwing them 100 feet high. A pipe from one of the wells being ignited, it burned with a jet of flame twenty feet long and as large as a hogshead. A stop cock placed on the pipe caused the pressure to rise to 180 pounds. The gas was pure and was thought to be sufficient to light a large city. Professor Newberry, in the *American Chemist*, estimated the yield to be 10,000 to 30,000 cubic feet daily.

1872.—The Newton gas well struck gas which was piped to Titusville and used as fuel and for illumination. This was the first natural gas plant in the country. The diameter of the first pipe was two inches, which was soon replaced by one of three and one-quarter inches.

1874.—Natural gas was used for the first time in Leechburg, in the manufacture of iron by the firm of Rogers & Birchfield.

1875.—After many failures the first successful attempts were made to shut off the gas in the pipes. The pressure at that time was not nearly so great as it became soon after.

1876.—A six-inch pipe line, seventeen miles long, was laid from the Harvey gas well in Butler county to Sharpsburg, and the gas used successfully in the Etna mills of Spang, Chalfant & Co.

1878.—A well was being sunk for oil eighteen miles east of Pittsburg, Pennsylvania. When it had reached a depth of 1620 feet a sudden and violent explosion took place. The derrick was blown away and a gush of gas began to escape with a roaring sound, heard for miles. After the first surprise, pipes were connected with the well and the gas was ignited. It was found to burn with great brilliancy, but for five years it was allowed to go to waste, after which it was conducted in pipes to Pittsburg and very successfully burned as fuel in steel works of that city. During the same year the oil wells at East Liverpool, Ohio, were considered one of the wonders of the world. In and around the city illuminating gas cost practically nothing. The street lamps burned day and night. It cost more to put them out and relight them than the gas was worth. The entire fuel of the town was natural gas. It was used in dwelling houses, and in twenty-two potteries employing 2,000 workmen. The first gas well, opened in 1859, was still producing.

1882.—The United States Government commenced publishing statistics as to the production, or rather the consumption, of natural gas in the country. What was produced can never be known, for most of it went to waste. These data were obtained by estimating the quantity and value of the coal displaced by gas. This year it amounted to $215,000.

About this time some oil drillers were sinking a well in Washington county, Pennsylvania, the object of which was to discover petroleum oil. On reaching the so-called "oil sand" a flow of gas commenced instead of the expected oil. By the escape of the flowing gas the drills were blown out with great force and the elastic vapor left the pipe with a roar, "the like of which was never before heard." Gas then being considered of but little value, although sometimes occurring in considerable quantity in oil wells, the drillers waited for several weeks with impatience, hoping and expecting the gas would become exhausted and oil follow. But they were disappointed. This was the afterwards celebrated McGugin gas well. The gas was ignited, and burned for months. It was considered a curiosity and was visited by many persons. Other wells in the vicinity sunk for oil produced gas, which was in a like manner allowed to go to waste, until at Pittsburg, near which similar wells were developed, the gas was utilized to a limited extent and found to be both cheap and convenient, upon which an excitement began in favor of the new fuel, which culminated in a general mania, followed by the usual formation of stock companies. In the beginning of this year the entire capital invested in natural gas in the entire country was only $150,000, but in two years it increased to $1,500,000. A well at Olena, Ohio, discovered in 1877, continued to produce gas for four years, when it became inactive and dwindled to a common and not very productive oil well.

1883.—The value of gas consumed in the United States was $475,000.

(To be Continued.)

Treating Rebellious Gold Ores.

The Beam process for treating rebellious gold ores, now in operation at Telluride, Col., is thus described:

A crusher, ten stamps, ovens and amalgamators are employed as follows: The ore, after being crushed, passes over a drying oven to the stamps and is crushed dry. The battery is open on both sides and the ore comes through a twenty mesh; it is then conveyed to sixty mesh over a hopper. All the ore that will not pass through this is returned to the stamps. From the hopper it is delivered on top of the furnaces or ovens, where it is mixed with the proper amount of salt and sawdust before it enters the roaster. After being roasted it is conveyed to the cooling floors; from there it goes to a grinding pan and is again ground liner. It then passes into the amalgamator, and when it leaves the amalgamator it is caught in a bag for the purpose, which takes the place of buckskin or chamois.

On top of the ovens are tubes or pipes to convey all the fumes that arise from roasting; these fumes pass through water, which condenses them, so that nothing is lost.

The ovens are 8½x46 feet, and in their construction two broad gauge and three narrow gauge cars of fireclay were used.

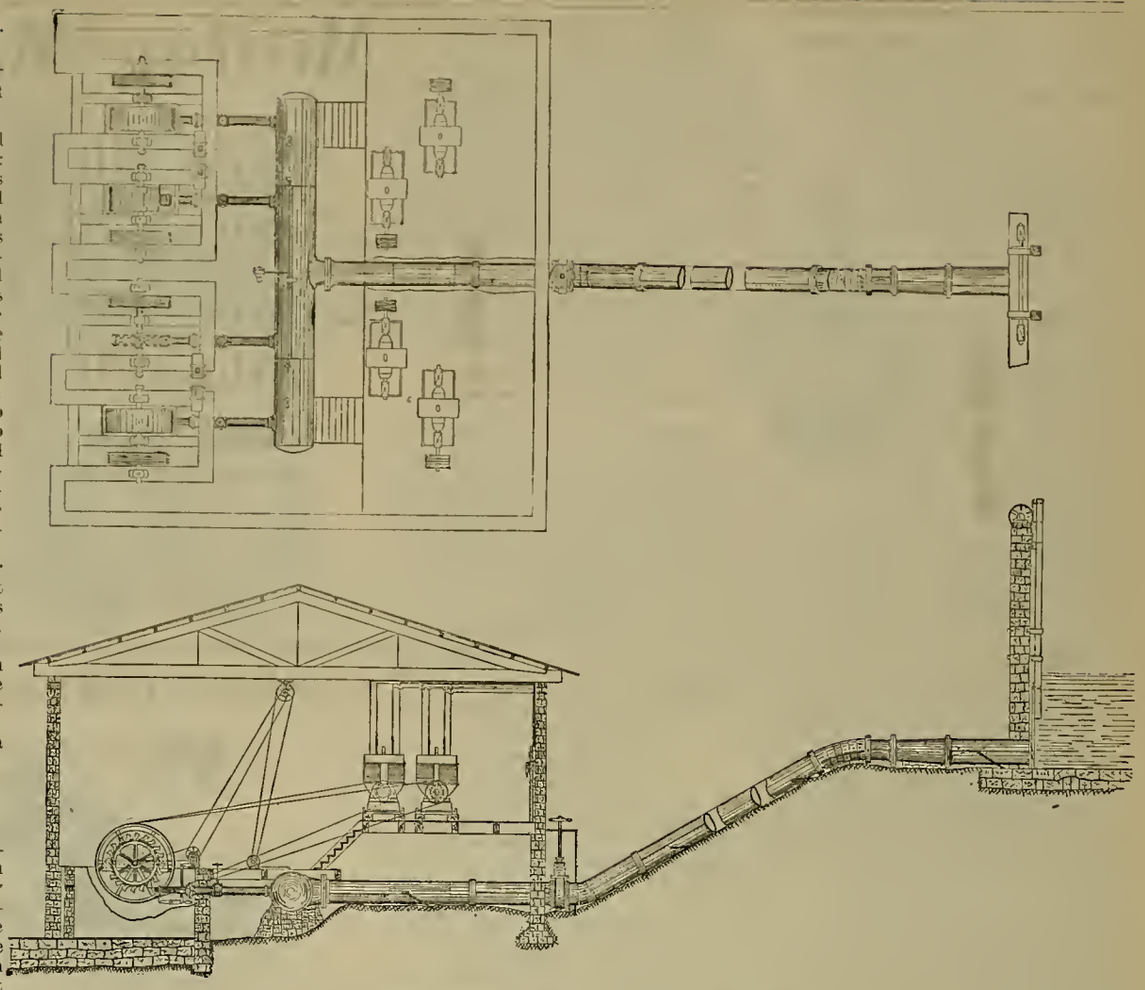
The entire plant is enclosed in a building 40x120 feet.

Not Good Policy.

We remember, says the Nevada *Herald*, that a few years ago a certain mine had been held for sale at a very reasonable figure. It was in a condition that it would require considerable money to develop it—scarcely more than a good prospect. A gentleman from this county went below and got some parties to come up with a view to buying the claim. When the owners found that there was a chance to sell, the price was raised to almost double the former price. The result was that the parties returned to San Francisco without so much as looking at the claim, and the person who brought them up was left with a great disgust on.

Nobody denies that the owner of a claim has a right to put any price upon it that he sees fit, but the question is, is it good policy to hold claims at the price that the mine is worth when it is opened? Is it good policy to raise the price just now when money is seeking investment in the mines? We think not.

Electric Power Transmission in South Africa.



WATER-POWER PLANT IN SOUTH AFRICA.

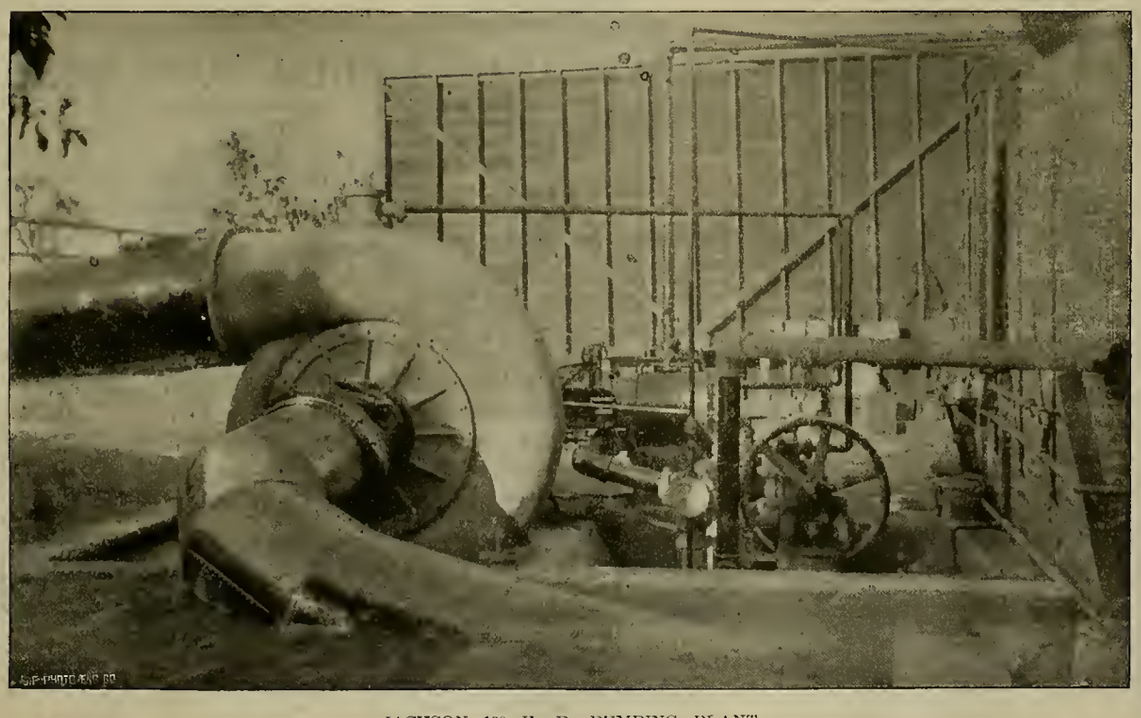
The above illustration shows a water-power plant furnished by the Pelton Water Wheel Company a year ago for the Moodies Gold Mining & Exploration Co., in South Africa. This plant is located on the Queen's river, near Barberton, and consists of four 125-horse power Peltou wheels run under 142-foot head at 150 revolutions.

The electric generators—four in number—are driveu direct from the water wheel shafts by rope sheaves six feet in diameter, grooved for five 1½-inch diameter ropes. The power thus generated is transmitted to the mines of this company—a distance of about five miles—and used for mills, hoists, concentrators, etc.

This plant has now been running about six months, and is understood to be an entire success from every point of view. A number of other stations of similar character are contemplated in the Transvaal—some of large power involving much longer transmission. This section not being very well provided with streams available for power purposes, resort is being made to electric transmission wherever possible.

Ambulance for Mine Use.

The difficulty of carrying injured men in mines through narrow and uneven passages has often been recognized. An apparatus inveuted by Dr. Paul Troisfontaines is described by the *Semaine Industrielle* of Brussels, and seems to be simple and convenient, as well as cheap. It consists of a sort of hurdle or litter made of hoops about eight mm. in diameter, placed parallel and joined by a fabric of cord or mat, somewhat like a hammock, thus giving when required rigidity in one direction and flexibility in the other. The injured man is laid in the litter with his legs extended and his arms at the side of his body; the upper part of the litter is then folded over and secured by three or four straps. The man then forms a package, and can be carried without the slipping and jolting of an ordinary litter, no matter how narrow or rough the workings may be. In case of fracture there is believed to be less danger in carrying a man in this way, holding him immovable, than in attempting to keep the broken limb in place by rough splints or bandages extemporized on the spot. These litters can be easily stored in a small space.



JACKSON 100 H. P. PUMPING PLANT.

Reclamation of Land.

The reclamation of land is going on at Randall Island, on the Sacramento river, where a large area of land is being converted from a marsh to productive soil. The accompanying illustratiou is of a Jackson 100 H. P. pumping plant, from a photograph taken while the pump-house was building and the plant at work.

THE German army has recently been testing paper horseshoes, and found their lightness and elasticity made it possible for a horse to travel "faster and farther without fatigue than one shod with iron." They are impervious to water "or other liquids."

Scientific Progress.

Invisible Worlds Beyond the Stars.

Let the photographic eye continue to observe in place of the human eye, it will penetrate the unknown. Stars invisible to us become visible to it. After an exposure of thirty-three minutes, stars of the fifteenth magnitude will have finished their task of impressing the chemical retina and placing there their images. The same instrument which to the human eye reveals stars of the fourteenth magnitude, and which would register about forty million stars in the entire heavens, discloses to the photographic eye 120,000,000, including only those of the fifteenth magnitude. It could reach forth to the sixteenth and throw before the dazzled admiration of the observer a luminous maze of 400,000,000 stars.

Never before in all the history of mankind have we had in haud the power to peuetrate so deeply into the abysses of the infinite. Photography, with its recent improvements, takes a clear picture of every star, no matter what its distance, and sets it down in a document that can be studied at leisure. Who knows if some day iu the photographic views of Venus or Mars some new methods of analysis may not discover to us their inhabitants? And its power stretches forth to the infinite. Behold a star of the fifteenth, sixteenth or even seveuteenth magnitude, a sun like our own separated from us hy so great a distance that its light requires thousands, perhaps millions, of years to reach us, notwithstanding its unheard-of velocity of 300,000 kilometers a secoud, and this sun lies at snch a depth that its light, so to speak, reaches us no longer. The natural eye of man never would have seeu it and the human mind never would have guessed its existence but for the implements of this modern art. And yet this feeble light, come frou so far, is sufficient to make an impression upon the chemical plate which will preserve its picture unalterably. This photographic plate takes us back to the past history of the universe. During the ethereal flight of this ray, which comes to-day to beat upon the plate, all the history of the earth has been accomplished, and in this history that of humau kiud is but a single wave—an instant. And during this time the history of the distant suu which photographs itself to-day has heen accomplished also; perhaps it became extinct long since; perhaps it is actually out of existence. Thus this new eye, which transports us across the infinite, enables us at the same time to trace the periods of past eternity. Yes, many of these far-away suns that we are goiug to such pains to photograph no longer exist. The end of the world has come to them as it will come to us; and the luminous couriers that they sent us before dying travel forever. Astronomy plunges us into the insoluble mystery of the iufinite and of eternity—and therein lies its grandeur.

Science in Soap Bubbles.

There is scarcely anything in the world which seems more utterly outside the realm of law than a soap buhhle. The delicate film, with its exquisite floating colors, its power of instantly vanishing, leaving no trace behind, hardly seems as though it could form a liuk in the inexorahle chain of cause and effect which we call physical law.

The atmospheric pressure on a buhhle six iuches in diameter is over 1500 pouuds, and yet the fragile film lies safely between the opposing forces of nature—the pressure of the outer air, the spring of the enclosed cushion withiu it, the downward pull of gravity, the upward push of the buoyant atmosphere and the molecular forces iu the film itself—so long as the bubble lasts; it is because of an exquisite adjustment of all the forces, physical aud molecular, concerned in its existence.

This is, of course, the merest commouplace, and yet it is one of the commouplaces of uature which, however well we may know them, never cease to he wonderful when they are in any degree realized. There are other laws governing films which are no less wonderful, though they are less familiarly known. A heap of bubbles blown while the pipe is dipped under the surface of soapy water looks like a chaotic huddle of hubbles of all sizes and many shapes; but, upon carefnl examination, it is found that never more than three films meet at an unsupported liquid edge, and never more than four edges meet at a liquid point, and that the angles are always equal; that is, films will not meet each other at an unsupported edge or point at an augle smaller than 120°—oue-third of a circle.

Electricity and Earthquakes.

Prof. John Milne, of the Japanese Imperial University, in a recent article in the *Seismological Magazine*, says that the results of experiments and investigations on a possible connection between earthquakes and magnetic aud electric phenomena do not allow us to admit any such connection. It is uot likely that earthquakes ever result from electric disturbances, and it has not yet been proved that they ever give rise to any such, though when large masses of rock are displaced, as in Japan in 1891, slight local changes in magnetic curves have resulted.

Under the Earth.

The workmen in the deepest mines swelter in almost intolerable heat, and yet they have uever penetrated over one seven-thousandth part of the distance from the surface to the ceuter of the earth. In the lower levels of some of the Comstock miues the men fought scalding water and could labor only three or four hours at a time until the Sutro tunnel pierced the mines and drew off some of the terrible heat, which had stood at 120°. The deepest boring ever made, that at Sperenherg, near Berlin, penetrates only 6702 feet. While horings and mines reveal to us only a few secrets relating solely to the temperatnre and constitntion of the earth for a few thousand feet below the surface, we are able, by means of volcanoes, to form some notion of what is goiug on at greater depths. There have been many theories about the causes of volcanoes, but it is now geuerally held that, though they are produced hy the iuteuse heat of the iuterior of the earth, they are not directly connected with the molten mass that lies many miles helow the immediate sources of volcanic energy. Everybody knows that many rocks are formed on the floor of the oceau, and it has heeu fouud that a twcutieth to a seventh of their weight is made up of imprisoned water. Now, these rocks are huried in time under overlaying strata, which serve as a blanket to keep in the enormous heat of the interior. This heat turns the water into superheated steam, which melts the hardest rocks, and when the steam finds a fissure in the strata ahove, it breaks through to the surface with terrific energy, and we have a volcano. We find that these outpourings that have lain for countless ages many thousands of feet helow the surface are well adapted to serve the purposes of man. Many a vineyard flourishes on the volcanic ashes from Vesuvius, and volcanic mud has clothed the hills of New Zealand with fine forests and its plains with luxuriant verdure. The most wonderful display of the results of volcanic energy is seen in the northwestern corner of our own land, a region of lofty forests and of great fertility.

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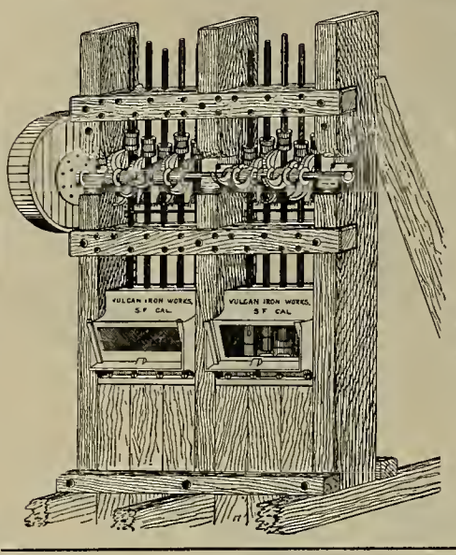

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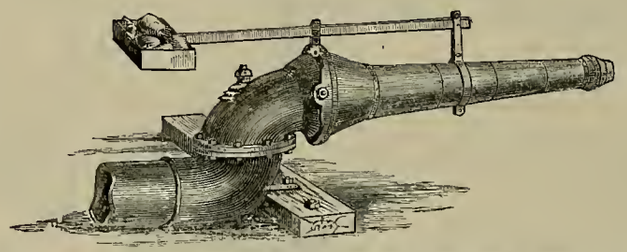

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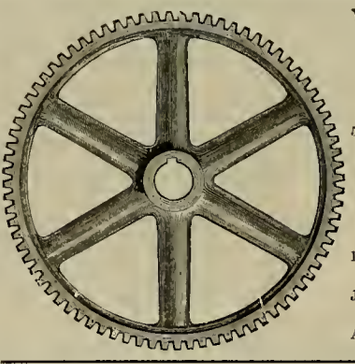

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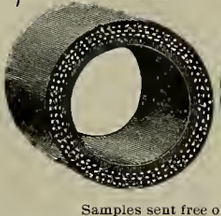
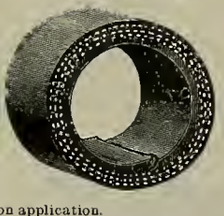


OLD LAPPED TUBE



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Mechanical Progress.

The Cost of an Indicated Horse Power.

A paper with this title was read at the recent Montreal meeting of the American Society of Mechanical Engineers by De Courcy May, who summarized his subject in the following table, showing the total cost of one indicated horse power per annum for various engines:

Kind of engine.	305 days of 24 hours. Coal per 2240 lbs.				308 days of 10½ hours. Coal per 2240 lbs.			
	$2	$3	$4	$5	$2	$3	$4	$5
Triple-expansion, pumping, Allis, 30 revs	18	55	61	67	31	33	35	37
Triple-expansion, without pumps, Allis, 50 revs	27	33	39	45	16	18	20	22
Compound mill, best engine	29	36	41	51	17	19	21	24
Compound mill, average	39	46	52	58	22	25	28	31
Compound electric light average	122	133	159	171	78	81	100	96
Compound trolley	18	58	68	70	29	32	36	39
Triple-expansion trolley	45	54	61	74	26	29	33	35
Condensing mill	45	52	61	69	25	28	33	38
Non-condensing, 50 to 300-horse power	70	76	81	88	40	53	57	60

The figures for engines below 50-horse power vary so widely that they have been omitted. The above table has been calculated as far as possible from actual engines running under ordinary conditions, but it is not pretended that the figures represent true average values, the compiler not having been able to collect information from a sufficient number of cases. The engines are nearly all high-class and of large powers. The figures in the table are therefore rather below than above the average.

Fuel Oil in Concert Valley.

The fuel used in the steam plant at the recent Midwinter Fair was crude petroleum. This plant constituted the entire steam power, consisting of eight Heine sectional boilers of 357 h. p. each, arranged in two groups of four. Each boiler had one large furnace nine feet one inch wide, sixteen feet long and five feet high, with four doors and draught openings. Crude petroleum was used as a fuel, and to adapt the boilers to this the bridge walls and grate bars were removed and the entire bottoms of the furnaces covered with fire-bricks. Pieces of fire-brick also were thrown in to make a mass that would retain heat for a considerable period. The bottom of the furnace was much lower than would be the case with coal as a fuel, the large capacity being necessary as the combustion was entirely in the form of flame. The door openings were closed with a screen of loosely laid red bricks, except an inspection hole about three inches square, and the screen effectually prevented loss by radiation. Each boiler was fitted with eight Graves' burners similar to those used by the Heine Company at the Chicago Exhibition, but better results were obtained in this city. The burner consisted of a cast iron tubular body screwed into the furnace front. The oil was carried through a tube placed axially in the apparatus and discharging by a hole one-eighth inch diameter. Steam entered at the side about the middle of the length of the casing and passed out through an annular opening around the oil jet. The jet of steam was made to take a rapid spiral motion by means of rifle grooves in the casing. The discharge openings for both oil and steam were adjustable by serewiug the parts into one another. When no steam was ou, the oil was discharged with sufficient force to throw a stream four or five feet into the furnace. The oil entered the apparatus through a pipe one-fourth inch diameter, under a pressure of twelve pounds per square inch. Steam entered through a pipe one-eighth inch diameter, full boiler pressure being used. The oil became completely evaporized, and no combustible matter was left in the furnace or tubes.

Outside the boiler room a large pit was dug and lined with wood, and in this were plaeed two iron tanks, each holding 7500 gallons. Tank ears were run to the pit and the oil piped into the receiving tanks. About 4000 gallous were used every day.

In the space between the boilers were placed two Dow pumps, size B, which supplied the oil to the boilers. They had suctions four inches diameter, and each could supply fuel for 4600-horse power of boilers. One was kept as a reserve, and for the light loads a smaller pump was used. The pumps discharged into a vertical tauk twelve inches by six feet against an air pressure of twelve pounds per square inch, maintained constantly by means of a pump governor controlled by the air pressure and shutting off steam to the pump as soon as the air pressure rose. There was a constant slight leak of air which was compensated for by a shifting valve on the pump.

The whole arrangement is described by an exchange as being so automatic that, during the hours of heaviest loads in the evening, only two men were required, one to look after the oil supply and the furnace and the other for the water; while during the rest of the twenty-four hours, from midnight until 6 P. M., one man easily took charge of the whole. No dirt being present, the boilers were painted white and remained so. If coal were used, six to eight men would have been needed. From midnight to about 6 A. M. the average load was about 200 h. p.; during the day from 800 to 1000 h. p., and during the heavy-load period in the evening 2500 h. p. The oil discharge from the pressure tank was three inches in diameter until it reached the line of the boiler fronts, where it divided into two pipes each two inches diameter and feeding four boilers.

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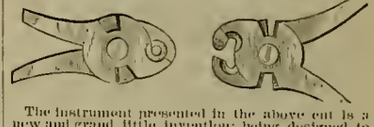

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

Herald: Wm. Osborn and Thomas Hardy, owners of the Bolitho mine a mile south of town, struck a five-foot ledge of good milling rock last Saturday, which has since improved greatly in richness.

The men working at the Mayflower mine near Murphys, who have about two months' wages due them, have received information that their pay is forthcoming. The mine is operated hy the owners of the Calico mine in San Bernardino.

BUYING MINING PROPERTY.—Angels *Herald:* James M. Jackson is here showing representatives of the Sierra Buttes Mining Company the Deer Lodge Consolidated gold mine, at Collierville, five miles east of Murphys, near the Stanislaus river. It consists of four full claims and has a water right of 3000 inches. Three of the claims are on one ledge and the fourth is on a parallel ledge. Although the mine has heen worked considerable, it is still very rich. The manner in which the Sierra Buttes Company intend to operate will enahle it to declare a dividend from $2 rock. It proposes to work the mine by water power and run a tunnel end on the ledge, therehy making sinking, hoisting and pumping unnecessary. A mill of 100 stamps will he put up, if possihle.

The representatives of the Sierra Buttes Mining Company who are here are the president and three of the directors, and have recently come to this country from London.

The company own the famous Sierra Butte and Plumas-Eureka mines, also the Uncle Sam mine in Shasta county. A purchase it has just made in Mariposa county is the Whitlock and Westward mining claims, the Whitlock, Spencer and North Whitlock mill sites, and the water location of A. H. Ward on the Merced river. Ahout 240 acres of land were conveyed in the transfer. The Spencer, Alahama and a numher of other mines contiguous to the Whitlock have been bouded by the same company, and they will probably he purchased hefore the expiration of the honds.

The company have also been endeavoring to purchase the Blair mine here, and agreed to pay $300,000 for it if it was satisfactory, but it was sold for that sum to other parties who had spoken for it first.

Humboldt and Trinity.

Advocate: J. H. D'Orsay and A. Colhurn bave crossed the Trinity summit, the Salmon summit, visited the New River mining camp, Hyampom and Elderpom valleys and the Trinity and Salmon rivers.

Eldepom is a large valley lying between the south fork of Trinity and the main river, and hig enough to accommodate 500 prospectors. Carroll creek, which has four tributaries, flows through the valley; a helt of gravel from half a mile to one and a half miles wide extends the entire length of it. It is thought that miners with ordinary sluicing could make all the way from one to three dollars a day there.

The people of that section do all in their power to discourage mining operations in the valley for the reason that they want their stock to have access to it.

At New River a great many prospectors were found, who, in most cases, were at work on old abandoned diggings. They seemed to be doing well. Messrs. Fulmore, McDowell and Leas have taken some good rock out of their new claim and are getting it in shape to sell to some syndicate with the requisite capital to develop it. Oliver Baker of Fortuna bought a little while ago an old claim on the river har for $25, and the first day took out $9.50 in gold

Inyo.

SOUTHERN INYO.— *Register:* Work on the Wilson & Co. property, eight miles south of Postoffice Springs, in the Panamint range, is progressing.

In Panamint P. Gallagher is at work on a small vein of high-grade silver ore. The ore works in San Francisco $600 per ton, hut under the existing price of silver is a hard horse to eurry.

At Wild Rose, Kennedy & Danielson are at work on the Mammoth leads of antimony. Could capital he induced to take hold of this property, it would be one of the greatest bonanzas in southern Inyo. On the dumps there are 150 tons of ore from 50 to 65 per cent antimony, and an ahundance of ore in sight.

In Mountain Spring canyon James C. Prewitt and partner have opened up a fine gold property. This mine had been abandoned years ago and considered worthless. These men relocated the mine and sunk a new shaft; have ore working from surface. Down 100 feet found ore working $80 per ton in the arrastra, and have two feet of ore that works $25 per ton. Capitalists have interested themselves and the owners are about to make a sale for $16,000.

Stiles & Mills, about six miles east from Mountain Springs, have a group of mines that they have been at work on constantly for the past two years. This ore carries hoth gold and silver, and the prospects are a mill will he erected soon on the property.

Mr. Meredith and John Curran have struck a rich vein of gold ore in the Slate Range country, the ore going $200 per ton in free gold.

THE CASEY.—This mine, the property of the Inyo Gold Mining Co., ahout eight miles northeast of Bishop, is steadily producing ore of a fair grade. The five-stamp mill is now at work on a run amounting altogether to 130 tons of ore. Work will shortly be begun on a vertical shaft to tap the ledge at a depth of about 130 feet, and hoisting works of some kind put on. It is probable that in the very near future a $1200 cyanide plant will he put up hy outside parties to work the 3000 tons of tailings at the mill.

TOO MUCH WORK.—*Index:* Baldwin Bros., late of San Bernardino, came in from Mazurka on Sunday with about four ounces of nice gold dust, the result of several days' work with their dry washer. There was too much work for the pay and they will not return.

Nevada.

The Champion mine will soon he in full swing again. The hoisting gear and tracks are heing inspected and everything put in first-class shape, preparatory to working the mine on a more extensive scale than ever. When work stopped, at the time the injunction was served on the Champiou Company, the lower levels were in good conditiou, being well timbered and the loose dirt and rocks being otherwise kept in restraint. As the months wore on the walls hegan to crumble and when the mine was explored a short time ago it was found that numerous chutes and drifts had caved in and the passages were otherwise hlockaded with loose material.

The Merrifield, another property owned by the Champion Company, is looking splendid at the present time and from indications it has a great future. There are about twenty-five men at work in and around this property, all that can he employed at present. The company is about to erect a mill on this property to crush the ore coming from the mine. It is now being crushed at the Champion mill. Two hundred men will be employed in the Merrifield and Champiou mines withiu the next few months.

THE GOLD POINT.—Superintendent Bennallack informs the *Union* that within the next two months one of the hest and most approved ten-stamp mills in the State, with Johnston concentrators, will be in operation at the Gold Point mine on Union Hill. This explains tbe levying of the twelve-cent assessment.

The Gold Point was cleaned out and some ore extracted this spring and the returns were so satisfactory that the company has come to the conclusion to open up the mine and push work vigorously. There are 10,000 tons of ore ready to he stoped out, besides some on the quartz dump. It is expected, judging from past crushings, that it will pay $6 per ton, and it will cost hut $1.50 to extract and crush it. This, consequently, admits of a hig profit.

The shaft is down 175 feet. The location is 2630 feet in extent, and there is a mill site of five acres.

Work will he commenced in a few days, and under Superintendent Bennallack's able management the property will be rapidly developed.

San Diego.

RICE MINING DISTRICT.—*Union:* The new Rice mining district a few miles east of Warner's ranch in this county promises to become the scene of permanent activity. The few mines already discovered there hy J. B. Rice, cne or two of which have shown signs of developing into first-class properties, have attracted other miners to this locality, and location notices aie now being received hy the county recorder almost daily. Yesterday notices were filed of the Bonny Bell mine, by Chatham Helm; the Sarah mine, hy Sarah A. Wright; the Good Luck mine, hy M. Rice and others; the Oelavie mine, hy J. P. Higgins and others; the Ellen mine, hy J. B. Rice and others, who also filed a notice appropriating 100 inches of water in Grape Vine springs, with five acres of land for a millsite.

Sierra.

THE EMPIRE MINE.—*Messenger:* The new owners of the Empire mine, in Gold Valley, are going to work with a will aud as if they meant business. There are now about forty men working at that place, over two-thirds working on the roads and in the woods. We understand that no attempt will be made to erect chlorination works this fall, as the season is too far advanced, hut that the company will devote its time to the fixing up of the sawmill, cutting lumher and prospecting the mine. The company has purchased the quartz mill on the Garibaldi property, ahout a half mile below the Empire, and will remove the machinery up to their own mine as soon as a road can he huilt, so we are told. The success of the Empire will mean a big help to Downieville.

The machinery for tbe Gold Bluff electric plant is on the way up from helow, and it will he put in place as soon as it arrives. It will he a hig saving for the company when it is in working order.

The Empire mine at Gold Valley will run their machinery hy electricity. They have plenty of power right at hand to run the dynamos, and it will he cheaper and more satisfactory in every way.

CONSIGNMENT OF MACHINERY.—*Union:* A large amount of machinery for the Golden King and El Capitan mines at Allcghany was transferred over the Narrow Gauge railroad last night. The new mill at the Goldcn King will he ready for operation next month, and the mill will be one of the finest in Sierra county.

San Bernardino.

A FORTUNE IN SILVER.—*Herald:* The impression which prevails that silver mines do not pay to work at this time is rather disproved hy the assertion made by C. W. Maxson, who returned from Keeler a few days ago. From him it is learned that D. C. Lane of Pomona purchased the Sorba mine last August, since which time he has actually put in the bank $35,000 and now has 100 carloads of ore on the dump worth $1000 a car. He has done this while developing the property, with no real intention of working the mine. Mr. Maxson says this is a fact which can he proven. It shows a pretty rich couditiou of silver ore, certainly. It is in this same district where Bellshaw & Beaudry took out $17,000,000. That was away hack twenty odd years ago. Remi Nadeau, for whom thc hotel in Los Angeles is named, also made money out of the camp by hauling ore and bullion to the nearest shipping point. At present, however, nothing hut the richest ore is shipped, as it costs $8 a ton to baul it to San Francisco, and another $8 to treat it after it reaches the smelter.

Tulare.

GYPSUM.—The Visalia *Delta* says: We have the purest gypsum in California, in inexhaustible quantities; there are two veins of terra cotta clay that can he traced several miles; there is a lead of graphite; coal croppings have been found at different places, and, last but not least, Martin & Goff have located a claim of red mineral paint. The ledge is 1500 feet long and almost inexhaustible. The paint is said to he of excellent quality. They have also located a copper claim which promises to be very rich in copper; also, a silver claim which tbey have tried, and from one pound of ore ran a 44-caliber bullet of silver. They have found a tin mine also. There has been no analysis made of any of their ores, but they will soon know what they have. Should these finds amouut to anything we may yet live to see this county inhabited by industrious citizens, and otber industries may spring up where we least expect them.

Siskiyou.

MINING NOTES.—*Journal:* The Spaugler Bros., at the mouth of Humhug creek, are getting ready to work the bedrock ehannel farther up the stream, to whicb point tbe derrick engine and pump will he removed this week. They have been taking out rich pay lately, aud when the open cut is made farther up will no doubt take out a great amount of gold, the hedrock being about 28 to 30 feet below the surface.

The Benz Bar claim at Houolulu, worked hy a Cbinese company, is said to be paying very rich, although it is hard to fiud out much from tbe Cbinese. This claim paid $140,000 a few years ago in sixteen months, on the opposite side of the river from Honolulu, and is now being worked on the Honolulu side.

The Beebe Bar, Conteunial, Fort Joncs aud several other claims along the Klamath river, from the mouth of Humbug creek to Honolulu, are reported as paying haudsomely.

The quartz mill at the Schroeder mine on Deadwood mountain, ahout nine miles south of Yreka, is kept steadily at work day and night in crushing a large quantity of ore on hand, which is paying well. The owner has a large force at work getting out more quartz, and the wood contractor has a large pile of wood to keep the engine moving, and is constantly hauling more.

NEVADA.

Washoe District.

The 1000 level of the Consolidated California & Virginia mine, which is heing worked through the old Consolidated Virginia shaft, is closed dowu. The works are stripped of air pipes, car tracks and everything that can he taken from them profitahly, aud all tools are removed. Operations on that level began the first of '94 under the "Rule contract," Rule undertaking to open a body of ore within six months. He failed, and after the expiration of his contract the Con. Virginia Company continued to prospect the ground traversed hy Rule's main drift. According to the weekly reports from the mine, no deposit of ore has heen found, and the company has concluded to suspend operations on tbat level in order, presumahly, to apply the money heing expended there at more promising points in the mine. The block of ground containing the ore hody recently found on the 1650 level will prohahly be given greater attention. The way this ore hody has continued to spread out indicates that its ramifications have not all heeu uncovered as yet, and that room for prospecting ahove and below it remains.

WHITE PINE COUNTY.—Men are at work on W. D. Campbell's mine in Steptoe valley. The ledge is eighteen iuches wide, and washes show the ore to carry from $80 to $100 in gold.

LINCOLN COUNTY.—*Record:* Messrs. Shean, Godhe and Lloyd have all machinery in good working order at the summit and will start leaching the tailings that are there. A test of the ordinary hypo gave the hest extraction and that will he used in the working of the same. They have every confidence of success from all the tests made, and will work on an average fifteen tons a day. They have gone to considerahle expense, and it is hoped that their greatest expectations will be realized.

SATISFACTORY.—Reno *Gazette:* Dr. Patterson is elated over the prospects of the Reno Borax Company, at Granite Point, this county. The first clean-up the company has made is 900 pounds of horax. The company has an expert borax and soda man—B. F. Gray—as superintendent of the works, and expects to develop a new industry that will pay.

OREGON.

JOSEPHINE COUNTY.—Rosehurg *Review:* K. B. Ireland has returned from his trip to Josephine county. He located some sixteen mining claims for two companies while there, and will soon return to hegin operations. These claims are situated on Althouse creek about forty miles from Grant's Pass, the ground along that stream having heen the richest in Oregon forty years ago when Mr. Ireland first mined there. The hars have already heen worked over as many as five times, and Chinamen are still washing away there. What he and his associates now propose to do is to work the henches and higher ground hordering the creek. They will first have to construct a three-mile ditch which will give them an abundance of water the year round.

JACKSON COUNTY.—J. L. Coyle of Henley, says the Ashland *Tidings*, reports that Wm. Rummel and George Parsley found a rich pocket of gold quartz recently on Ash creek, a tributary of Klamath river, ahout eight miles below Hornhrook, from which they cleaned up $1500 with a hand mortar in one week. Tbey are on tbe bunt for another pocket and have good prospects of finding it. A miner named Reader has mortared out nearly $10,000 during the past eighteen months from a small quartz ledge wbich he has located just across the river from Asb creek. He calls his claim "Fool's Paradise." About a year and a half ago he struck the first pocket and took out $4000. Since then he bas found hunches which yielded as follows: One each of $150, $300, $3200, $1790, the last amount being cleaned up by himself and another man in eight days in August. The gold is found in kidneys or pockets lying between tbe quartz and the porphyry.

WASHINGTON.

"At the new camp of Monte Cristo, in the Cascade mountains, north of Seattle," says D. H. Gilman, "some large quartz mines have been opened. There are a numher of silver properties that are also turning out well. The ore from this new district is concentrated at the mines and then shipped by rail to the town of Everett, on the Sound, where a smelter with a capacity of 500 tons a day has just been completed. Besides these mines some gold properties bave heen opened near Wenatchee, on tbe Columbia river. In one place tbere a mine belonging partly to Judge Burke has been opened that has developed an enormous quantity of quartz. It only runs $8 a ton, but there is so much of it that, like the Douglas Island and Homestake mines, it promises enormously. Over the State there is much interest in mines.

IN THE CASCADES.—On the line hetween Okanogan and Wbatcom counties a placer prospector recently discovered some float quartz and followed the signs up the mountain streams. Finally he lost all trace of it on the surface and began digging, with no indication of a ledge in sight. He was rewarded, he says, by pay dirt from the grass roots, with rich decomposed quartz intermixed. At a depth of five or six feet he struck a ledge of rotteu stuff that showed free gold all through. The ledge was crosscut and its width determined at 19 feet. The discoverer and his partner are operating a rocker on surface dirt and are said to be cleaning up $50 a day.

STEVENS COUNTY.—HUNTER CREEK.—*Index:* County Auditor Miner received this week fifteen mineral location notices, representing claims of mineral bearing rock deposited in the district of Hunter Creek. There is much excitement over the new discoveries tbat have been made on Hunter creek.

The ledge is twenty feet wide, and is said to he a lead deposit rich in carbonates. Samples already tried have proved nearly 100 ounces of the white metal, and gold and copper abound to some extent, the former being quite profusely distrihuted along the vein which can be traced over the surface of the earth for nearly four miles.

BRITISH COLUMBIA.

HALL MINES.—Two trial shipments of argeutiferous copper ore from the Hall mines, have heen made. One, of first-grade ore, assayed at Swansea 146 oz. silver and 12¾ per cent copper to the ton of 2,240 lb., and tho other, of secoud-grade ore, assayed at Denver, Colorado, 93.03 oz. silver, 0.13 gold, and 10.98 per cent copper per ton of 2,000 lb. The development work at the mine is being vigorously pushed forward.

IDAHO.

A FALSE BEDROCK.—*World:* The *Statesman* says "the Boise County Mining Company was organized for the purpose of exploring the ground under what is believed to be a false bedrock. The formation is very similar to that in some other camps whore fahulously rich ground was found at great depth." All the above would he correct if the word "believed" were stricken out. This *is* a false hedrock. That fact has never been questioned. Along the creeks for three miles or more, below and ahove Idaho City, and for a distance up the hills on each side, varying from half a mile to a mile or more, this false hedrock has formed over the original bedrock, which is granite. It is plain that this false hedrock was formed by the action of wator, and the general helief is that a lake once covered it.

CŒUR D'ALENE OUTPUTS.—The mines of the Cœur d'Alenes are putting out about 200 tons of concentrates daily, and giving direct employment to nearly 1000 men. The detailed figures are as follows:

Mines.	Output.	Men Employed.
Gem	40	155
Standard	10	45
Helena and Frisco	30	120
Mammoth	5	20
Poorman	45	200
Tiger	25	80
H. H. & S.	50	350
Totals	205	970

The foregoing figures only cover the miners employed. Indirectly the mines give employment to some 500 others—timhermen, employes of the boarding houses, office forces, etc.

Tbis is ahout half the capacity of the developed mines of these camps. If all the mines were running there would he employment for ahout 3000 men. Of course, that in turn would give indirect employment to others.

The mines that are not working are the Hunter, Morning, Black Bear, Custer, Sierra Nevada, Last Chance and Stemwinder.

THE MAMMOTH.—Idaho *World:* Eight or ten men are at work sinking an incline in the Mammoth mine, on Summit Flat. The saw mill is cutting timbers, and it is helieved that work will continue without cessation hereafter. The mine although rich, and large, has lain idle for a good many years. J. J. Taylor, formerly of Ketchum, is the superintendent.

De Lamar *Nugget:* Some of the most heautiful specimens of silver were taken out of the De Lamar mines this week ever seen either

in Idaho or elsewhere. They consist of masses of pure silver in the form of leaves and moss. The leaves and sprigs are so delicate and fragile that the bunches will scarcely bear handling. They are as white and bright as burnished silver. There were several pounds of these beautiful specimens in the crevice.

Coeur d'Alene *Miner:* The first serious accident that has occurred in the Poorman mine for a long time took place there Tuesday morning about two o'clock. Patrick Hanley and Tom Lewis were working together and at the moment of the accident were engaged in barring down the ground which had been loosened by blasting, when a large piece of galena weighing over a ton, fell without warning on Hanley's back, killing him instantly.

There are now about 120 men working at the Gem mine and about forty at the Standard."

MONTANA

A LITTLE ENCOURAGEMENT. *Inter-Mountain:* The recent slight advance in the price of silver has given a little encouragement to leasers who are operating silver properties, and a farther advance is expected when Congress adjourns. Although none but very high-grade propositions will pay to work at the present market value of the metal, there are a number of leasers who have recently taken hold of mines out of which they hope to make at least wages. Out in Independence mining district, west of Butte, several miners have secured properties, some of which, in the days before silver's debasement, were ranked with the great producers of the world.

THE LEXINGTON. It is possible that the Lexington mine will shortly be closed down entirely for an indefinite period. During the past year only a few leasers have been at work underground, and many of them, it is said, at the present price of silver, have been unable to make wages. Some years ago the shaft of this mine was developed to the 1500-foot level, a crosscut several hundred feet in length was run south, but no ore bodies were found. Later the pumping machinery was removed from the 1200, 1350 and 1500-foot levels and the mine was allowed to fill with water to the 800. Now the pumping machinery at the 800 level will be removed, it is said, and a smaller pump will be placed at the 600, to which level the water will be allowed to rise.

IN MADISON.—Pony and Norris are fast becoming the leading gold camps of the State. Every week several carloads of ore averaging from $100 to $200 per ton are shipped to Butte for treatment. A Denver mining man named Dunham recently bonded the Revenue mill and mine in a large sum, and is now engaged in increasing the capacity of the mill to fifty tons per day.

GENERAL MENTION.—Madison *Monitor:* The average assay of the Old Joe ore, eighty-three tons of which were milled recently at the Pony mill, was $22 per ton in gold. This from such a large body is very encouraging. Development work in the mine is progressing.

Bozeman *Chronicle:* John Mitchell of this city sold the Little Bonanza mine in the Crevasse district to E. D. Edgerton, the Helena banker and president of the Crevasse Mountain Mining and Milling Company. The consideration is $5000.

New Idea: E. C. Wittich and C. J. Barnett report the mines of Sunlight Basin looking well. The General Lee mine has a tunnel in 50 feet and the mine has a large body of ore that runs $35 in silver and 47 per cent copper.

Western News: The Nine Mile Mining Company at Martina is running its twenty-stamp mill and is working a large force of men. The San Martina Mining Company is erecting a five-stamp mill which will be running on or shortly after September 1st. Fifteen men are working at present.

Madisonian: A twelve-inch vein of ore, increasing to eighteen inches, was exposed this week by the lessees of Gilbert's Villard mine. The quartz is crystallized with bromic coloring, but differs considerably from that heretofore exposed. Assays of some show $100 in gold and from 400 to 600 ounces in silver per ton.

The shaft on the Kennett mine is down over 230 feet, and the free gold, showing abundantly in specimens, is in heavier particles—the reverse of the flaky-leaf gold in the Bertha—and the ore vein is reported over four feet in width. The matrix, however, is still a sort of bastard quartzite and is heavily charged with oxide of iron.

The Eagle Hill Company is reported to have taken $2400 of placer gold from two boxes at the diggings above Summit. Nuggets worth $400 were picked up one day last week.

UTAH.

TINTIC DISTRICT.—The work of enlarging the Mammoth mill is being pushed to the greatest possible extent. Preparations will be made for forty more stamps, making it a sixty-stamp mill, but only twenty more stamps will be put in at once. One hundred and fifty tons of concentrates are now being shipped monthly, which is only a small part of the product of the mill.

The Eureka Hill mill will probably be running by the first week in September, and will be the most complete mill in the Territory. Work has been unfortunately delayed on account of the non-arrival of important machinery, but is now going forward with the greatest possible rapidity. The Eureka Hill mine and mill should furnish employment to seventy-five additional men, which will be a great lift to the district. The work of the mill is entirely automatic and it should take care of 125 tons per day. A mammoth reservoir has been constructed on the south side of the mill which has a capacity of 500,000 gallons, and will furnish an abundant supply of water.

THE DALY WEST.—Park *Record:* From all accounts the recent strike in the Daly West is something tremendous. The ore body has been uncovered for more than 120 feet and still the end is not yet. So far all the developments have been confined to stripping the ore and no stoping at all has been done. As the work proceeds the magnitude of the deposit becomes something wonderful, while the quality of the rock is all that could be desired and shows for itself wherever and whenever examined, and is readily estimated at 300 ounces in silver to the ton, with from 40 to 65 per cent lead.

NEW MEXICO.

MOGOLLONS DISTRICT. *Enterprise:* A big strike has been made on Captain Sawyer's mine on the Queen lode. At a depth of 101 feet the vein is eight feet in width, all of which is pay ore. Four feet of the vein runs from two to four ounces in gold, per ton. An adit level is being driven on the vein from the bottom of Mineral creek canyon. This will strike the ore chute, found above, at a depth of 258 feet, giving great stopes over head and making it easy to extract and deliver on the dump for shipment to reduction works.

On the Confidence mine ten men are employed making upraises and blocking out the ore bodies ready for back stoping. The ore bins at the mill are about two-thirds full and will soon be filled to their utmost capacity, which is about 1,600 tons. The mill is rapidly approaching completion. Machinery held back by the strike caused some delay but the mill will probably be started in operation between Sept. 20th and Oct 1st.

The Colonial company continues to produce its regular shipments of gold and silver bricks from the ores of the Maud S. The base ore struck some time since is proving to be of exceedingly richness, and when extracted, is being stored away for reduction, probably by a different process.

The Sheridan mill is running successfully, under the management of Andy Wiley, a practical mill man. The Little Fanny ore is being worked to pay for the first time in its history.

The Deep Down company are at work developing the ore bodies in the mine and putting the mine in shape for the economical extraction of ore. In the meantime and until the ore bodies are opened up the mill will be run on custom ore. The Deadwood and Consolidated mines will probably furnish an abundance of ore to run the mill.

ARIZONA.

Payson District.

Silver Belt: There is considerable stir in mining in Payson district. A number of good claims are being developed and the custom mill is well supplied with ore. Lessees of the "85" mine had just finished milling 25 tons of ore, which yielded $49 per ton. Yarnell, of Phœnix, is putting up a three-stamp mill on Rye to work ore from his mine, the Wolsey, and he is promised 300 tons of ore from the Zulu, owned by Hill & Samuels of Prescott. Wentworth & Pieper are preparing to erect a five-stamp mill on Verde, and are now putting an old ditch in order. The power will be furnished by a turbine wheel.

Coast Industrial Notes.

—A telephone line is building from Grass Valley to Marysville.

—The first central electric light plant in Alaska is being put in at Juneau.

—It is reported that the Sierra Lumber Company has absorbed the Tahoe Flume Company in Nevada.

—It is reported that the Great Northern has bought out the Bellingham Bay Improvement Company, lands and railroad.

—For the year ending August 1st, 140 vessels cleared with lumber from ports on Puget sound and in British Columbia.

—The Gila Bend canal and dam site, valued at $1,500,000, at Phœnix, Arizona, has been bought by the Colorado Canal and Land Company for $900,000.

—During the week the Arabia sailed for New York with 1000 flasks quicksilver, 163 sacks shells, 1170 sacks antimony, 141 tons dross and 43 tons infusorial earth.

—The Contra Costa Water Company will issue new bonds to the amount of $2,000,000 to provide for the retirement of $1,000,000 bonds which will become due July 1, 1895.

—The Oroville Gas, Electric Light and Power Company has organized with a capital stock of $32,000, to buy the Oroville Gas Works. The new company assumes control to-day.

—The Seattle Home Telephone Company has incorporated. Capital, $100,000. Incorporated by John H. McGraw, J. D. Lowman, A. B. Stewart, A. M. Brooks, George Gunds. To operate telegraph and telephone lines.

—Jas. P. Witherow of Pittsburg, Pa., is here with the idea of establishing steel works in British Columbia, Washington or this State, to cost about $2,000,000. He wants a bonus as a preliminary to the work.

—The Northwest Interstate Exposition was formally opened at Tacoma, Wash., last Thursday. Work has begun on the main building for the Southern California International Exposition, which is to be held at Los Angeles from October 15th to January 15th.

—The rate on flour to China and Japan, which was $4 a ton for the last eighteen months, has been raised to $6, there being a combine between the Pacific Mail and the Canadian Pacific. The increase goes into effect on the Belgic's cargo next Thursday.

—The Golden Gate flour mills in this city have been closed by the "big combine," and the establishment that made the cheapest flour in the State is for rent or sale. About one-half the flour mills in the State are now idle by reason of their being in the combination.

—During August, five transpacific steamers brought 21,170,000 grain bags here. The Hongkoug steamers brought 5,525,000 additional. The San Quentin manufactory turns out about 4,000,000 annually; California Jute Mill, 2,000,000; local factory, 500,000; Washington State Prison at Walla Walla, 1,500,000, making a total of 34,695,000 bags. The average annual consumption of the coast is about 35,000,000 bags.

—Talking of the new tariff on opium, reduced from $12 to $6 a pound, Collector Saunders of Washington State says: "While the new tariff reduces the duty on opium one-half, that will not affect smuggling, except to increase it about one-half. The smugglers will have to carry just twice the amount to make as much hereafter as they have been making heretofore, and they will do it, too. The new tariff will not stimulate the importation of coal from British Columbia."

—Recent electrical incorporations are the Eureka Electric Company of this city, incorporated by H. A. Smith, J. H. Lawrence, M. S. Lawrence, A. and E. S. Hough. The Solano Electric Light Company of Benicia. Capital, $10,000. Incorporated by T. McKay, K. Chism, K. McArthur, P. Pry of Benicia and G. Frame of Elmira. The Santa Fe, N. M., Gas and Electric Company. Capital, $100,000. Incorporated by S. F. Day, P. B. Coffin and E. L. Bartlett of Santa Fe and C. H. Coffin and J. M. Howells of Chicago.

—A Washington dispatch of last Thursday says advices have been received at the Navy Department concerning the preliminary trial trip of the Oregon, which indicates that she will earn her builders a good premium. On four trips she made continuous runs of six hours each, and the engines were not stopped. It is expected the vessel will make sixteen knots an hour. The contract requires a speed of fifteen knots. The report says she steers like a little boat, and that the final trials will develop not only good speed, but a very easily managed ship.

—The Los Angeles Consolidated Electric Railroad Company has a bonded indebtedness of $3,000,000 and must pay interest on these bonds, amounting to $90,000, by the 16th of this month. Of this amount the Pacific Rolling Mills holds $700,000; the Pacific and People's Home Banks, $600,000; the Bank of California, $150,000; the San Francisco Savings Union, $250,000; J. D. Fry, $50,000; W. H. Piper, $50,000; R. R. Thompson of Oakland, $50,000; the National Bank of California of Los Angeles, $75,000; the Illinois Trust and Savings Company of Chicago, $150,000; Peabody & Co. of Chicago, $150,000, and the remainder in small amounts. It is thought the Los Angeles company will default on the September interest. They request that they "shall be released and discharged from the payment of interest on its bonds of the issue of March 16, 1892, for the period of one and one-half years from the 16th day of March, 1894, and that the interest on said bonds shall be thereafter reduced to a rate of five per cent per annum."

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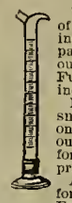

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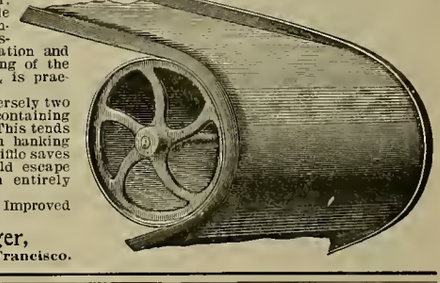

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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Practical Information.

An Hour's Stroll.

Have you ever thought of the distance you travel while you are out on an hour's stroll? Possihly you walk three miles within the hour, hut that does uot hy any means represent the distance you travel. The earth turns on its axis every twenty-four hours. For the sake of round figures we will call the earth's circumference 24,000 miles, and so you must have traveled, during your hour's stroll, 100 miles in the axial turn of the earth.

But that is not all. The earth makes a journey around the sun every year, and a long but rapid trip it is. The distance of our planet from the sun we will put at 92,000,000 miles. This is the radius of the earth's orhit—half the diameter of the circle, as we call it. The whole diameter is therefore 184,000,000 miles, and the circumferenee heing the diameter multiplied hy 31416, is ahout 578,000,000.

This amazing distance the earth travels iu its yearly journey, aud dividing it hy 365 we find the daily speed about 1,586,000. Then, to get the distance you rode around the sun duriug your hour's walk, divide again hy 24, and the result is ahout 66,000 miles. But this is uot the end of your hour's trip. The sun, with its entire hrood of planets, is moving in space at the rate of 160,000,000 miles in a year. That is at the rate of a little more than 438,000 miles a day, or 18,250 miles an hour.

So, adding your three miles of leg travel to the hour's axial movement of the earth, this to the earth's orhital journey aud that agaiu to the earth's excursion with the suu, and you find you have traveled, in the hour, 85,253 miles.

To Dam the Nile.

From time immemorial the Nile has, like other large rivers, discharged an enormous flood at one season and yielded a less lavish amount at another. So low are its shores, much of the way, that great inundations result from high water. Partly to reclaim some of this land, and partly to secure a more ample supply in times of drought, it has heen proposed to coustruct a dam iu some eligihle place, aud thus to store the excess in the season of overahundance. Engineers have heeu over the ground within a few months, and have just made their preliminary report. The hest site yet found for the purpose is at Assuan, 1300 miles from the Mediterranean. It is situated at the end of a series of cataracts. Here a good foundation ou igneous rock could he laid. Ahout 5,500,000 acres of land would he made availahle for agriculture and other pursuits by this enterprise. But as the country ahove Assuan is very high, the dam would back water for 125 miles up stream, to Korosko, and suhmerge the sites of several interesting old temples. It has not yet heen decided whether or not to go ahead.

Hoarding of Gold.

A writer in the *Pall Mall Gazette*, of London, calls atteution to the enormous accumulation of gold in that financial center, the total amount of gold now in the Bank of England heing nearly $200,000,000, a sum unprecedented in the history of that institution. Referring to this fact, this writer states that, as after 1867 and 1866, the Bank of Englaud "is ouce more watching for the time when the mighty torrent of gold will again burst the dam and cause a general and rapid improvement in the value of securities." People, says he, must have something for their money, and the question soon must he, who is going to set the example for going in for the purchase of second, third and fourth-rate investments? "In times gone by the same process has always heeu gone through, and it must inevitahly he gone through again. At the present time there are some thousand millious sterliug of money, or $5,000,000,000, lying on deposit with the London banks, and hardly any of the depositors dare to move their portion iuto securities that are not gilt-edged."

THE average export price of wheat from the United States for the past cereal year was 67.2 cents per hushel, compared with 79.9 for the preceding year, and an aunual average of 90 cents for a period of ten years euding with 1893. The average price of flour exported for the year was $4.11 per barrel, compared with $4.54 the precediug year, and an annual average of $4.81 for ten years euding with 1893.

The Fauvel Process.

W. E. Meade of Cheyenue is ahout to introduce the Fauvel process into the Silver Crowu district, Wyomiug, where the Oronogo Miniug Compauy owns a numher of veins varyiug in width from six to twenty-four feet, all low grade, showing au average value of $6 per ton. The Fauvel furnace will cost ahout $50,000, hut it is expected to treat ore at an average cost of $1 per ton, without the use of either chemicals or electricity.

P. G. Sanford of the Royal Mint, Loudon, gives a description of the Fauvel process, saying:

"Heat, air and water are used to oxidize the refractory elements and liherate the gold. By the time the ore has reached the bottom of the tower it is completely sweetened and is ready for further treatmeut. This generally consists in wet amalgamation; and as water must play an importaut part in that process, the idea suggested itself that the cumhersome system of trucks and coaling floors might be advantageously replaced a running stream of cold water. Acting on this, Fauvel made hy a number of experiments on the effects of quenching the incandescent ore in a hath of cold water. The results surpassed all expectations. Each glowing particle, as it falls into the water, causes an instantaneous generation of steam, accompanied hy a report of a miniature explosiou. At the same moment, auy glaze or film which may have formed on the particles is ruptured, aud they are hroken down to a remarkably fiue state and rendered very hrittle. So much is this the case that an arsenical pyrites which had heen crushed ouly to pass a thirty-mesh sieve was, after roasting and queuching, reudered an impalpahle powder. The importance of this innovatiou cau hardly he exaggerated. In the first place, exceedingly fine crushiug is not necessary, and therefore the output of the mill can be very much increased. In the second place, the ore is reduced to such a microscopic size as to make the retention of gold articles impossihle. Thirdly, the film of oxide, which is so apt to coat the grains, is removed, and the gold is reudered clean aud shining and in condition specially adapted to amalgamation."

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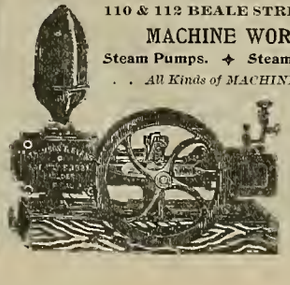

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Mining in Shasta County.

To the Editor:—Mining matters seemed at a low ebb here four or five weeks ago, but at the present time the marks of prosperity are seen everywhere. Placer mining by the dredge system in the Sacramento river near Middle creek promises to pay larger dividends on the investment than anything in the county. The Deestlehorst dredge is a home-made affair, cost about two thousand dollars and was built by men wholly inexperienced after various changes and alterations and numerous breaks. The dredge commenced to find the pay channels. They have a large bucket holding about one ton, and work in the coarse gravel and boulders. Finding no pay in the sand or fine gravel, the gravel is dredged from a depth of from ten to twenty-five feet, dumped on a grizzly with a shaker attachment, which drops the boulders back into the river and lets the fine material down into a line of sluices. About a cord and a half of wood furnishes steam for the twenty-four hours, and six men do the work. The average clean-up has been $150 a day for the last two months, with ground enough on the various bars to last them fifty years. There is room enough for a dozen dredges to operate indefinitely on the bars The Chinamen who flumed Clear creek near Igo have in 500 feet of flume and work twenty men. They are in new ground and average $200 a day. White men would have nothing to do with it, but John gets there. Iron mountain is laying in a stock of wood and preparing for a fall run. They will probably mill six or eight thousand tons of ore. The Balla Callela windy camp group are working a force of men cleaning out tunnels, building a wagon road to connect with the Uncle Sam wagon road, and are also grading a mill-site and putting in a flume to furnish power from Squaw creek. The Minnesota mine starts up running ten stamps next week, their tunnel now being in 970 feet on the ledge, and cutting three ore chutes. They have 400 backs and will probably make a good record. Quartz Hill, presided over by Count Maryanskai, has been running their ten stamps at the Calumet plant over a month. The results of the first week's run were nothing; the next week they assorted the ore and made expenses. Since this they have learned a lesson, leaving out barren rock, and the results have been satisfactory. They have ordered ten more stamps and a locomotive for their three miles of railroad. A steam drill is being used at the mine, and the mine worked as an open cut. Jack Conant has just unloaded a ten-stamp mill, which goes to the old Wheeler mine, near the Gladstone mine, in French Gulch.

The Gladstone managed to pay off its labor accounts this week, and now has only $15,000 of attachments to settle. It is understood that negotiations are complete for meeting these when they will resume operations. Prof. Morton has a bonanza in the old Myers mine, near the Tom Green, in French Gulch.

Machinery for the quicksilver mines in Trinity comes rolling in in carloads daily. The road is strung with teams. The gold quartz finds near Trinity Center are phenomenal. Ore working $300 to $400 per ton is found in quantity and excitement runs high in the Old Diggings. The Walker mine struck a large ore body a few weeks ago at a depth of 400 feet from the surface, and its superintendent estimates 170,000 tons of twenty-five-dollar gold quartz in sight. Hart's Bullyehoop mine is about to try wet chlorination again. Hart's Texas & Georgia at Old Diggings is running twenty stamps as usual. Dr. Garlick, who has the Bully Hill mines under bond at Copper City, has got the old 800-foot tunnel open and uncovered the copper ledge. It is sixteen years since this tunnel was opened before. A large body of low-grade copper ore is already exposed.

G. A. F.

Redding, Cal., Aug. 22, '94.

No. 6.

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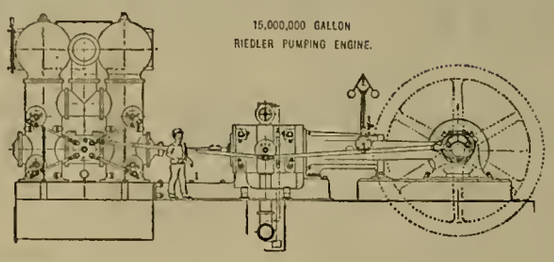

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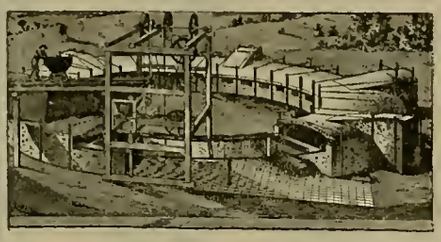

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A Philadelphia firm, said to have plenty of capital, has control of a process of treating low-grade ores, and the "Nascent Extraction Metal Co." has been organized.

"In practice," says the inventor of the process, "results are obtained by grinding the ore to about forty mesh and mixing with about one-half its bulk of coke ground to ten mesh, or even larger, and placing the mix in a tank having a false or dropping bottom made of carbon plating and covering the ore with brine. Upon the passage of an electrical current chlorine is eliminated within the ore, owing to its porosity and conductivity, and the gold is immediately dissolved and transferred by the current by a slowly revolving metallic cylinder on which the gold is deposited and wiped off continuously. After the ore has been exhausted the false bottom is dropped, allowing the mix to fall upon a sieve of such a size as to allow the spent ore to be washed through, while leaving behind the larger sized particles of coke or other carbon to be reused.

"It is calculated that with ease as much as twenty tons of ore can be worked at one time, and the time will be from one to five hours, according to the amount of metal in the ore and the strength of current needed. One electrical horse power will deposit over one pound of gold per hour. In our method we lose nothing; everything is recovered except the horsepower and small mechanical loss of the materials used. The amount of water often is a consideration in treating ores. In our method little is required, after obtaining a suitable supply at the outset. Roasting of the ore is not needful, since any gold combination whatever can be undone by electrolysis."

TUBBS CORDAGE CO.
(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. ☞Extra sizes and lengths made to order on short notice

611 and 613 FRONT ST., San Francisco, Cal.

P. & B. PAINT.

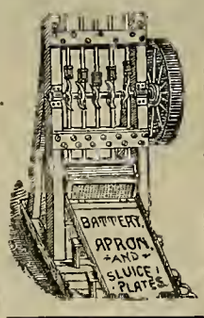
Absolutely Acid and Alkali Proof.

For CHLORINATION WORKS and Preserving Wood and Iron from Acid Attack, Rust or Decay.

P. & B. ROOFING.

Send for Circulars.

PARAFFINE PAINT CO., 116 Battery Street, S. F.



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For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
653 and 655 Mission Street, San Francisco, Cal.

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Every description of work plated. Send for Circular.

Double Acting Cornish Plunger

Pumps twice as much water as the old Cornish pump and "only one-third the weight."
SPECIAL CONSTRUCTION OF STEEL for packing on mules, only one-twelfth the weight of the ordinary Cornish Plunger.

IMPROVED SINKING PUMP.

Bucket and clack changed under water, saving expense of putting down another pump when the bucket or clack gives out under water. Bucket gearing lasts six times as long as the old gearing.
First outlay one-third less and works with ten per cent less power, "paying for itself in one or two years, according to the price of fuel."

WM. NANCE.....Grass Valley, Nevada County, California.

DEWEY & CO., PATENT SOLICITORS.
220 Market St., San Francisco, Cal.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 30, 1894.

The swing of the pendulum is sending silver up, and though there is a great deal of difference between $1.29 and 66 cents, yet even the fifteen cents advance during the mouth has encouraged thousands all over the coast in the hope that the advance will continue.

Lead does not seem to share in the advance. There is a good deal to he said regarding the constant and (to the consumer) the unsatisfactory difference between the New York lead quotations, as wired, and its actual price.

Considerable has been published concerning the manipulation of lead quotations by the smelting combine, or the "lead trust." The Salt Lake *Tribune* declares that the producers of lead ore in that region have been bled by the Lead Trust from $2.50 to $7 per ton on all the lead contained in the ores which have been converted into bullion hy the smelters.

To appreciate the magnitude of the "sweating" the Western producers have been subjected to hy the Lead Trust, it furnishes the following figures which show the prices at which sales are made of deliveries of lead in warehouses licensed hy the New York Metal Exchange, at net cash prices, and in quantities of not less than twenty-five tons:

On April 19th last the selling price paid for lead in New York was $3.45 per 100 pounds. From April 20th to 26th, inclusive, $3.42½ was the selling figure. On the 27th it dropped 2½ cents, and on April 30th the hasis of settlement for deliveries was $3.37½. To May 2d, inclusive, the quotation was the same. From May 3d to the 11th $3.35 was the actual price paid. On May 16th $3.35 was the settling basis, and the correct quotation on the 14th, 15th, 17th and 18th was $3.32½. On May 21st the price dropped 2½ cents, hut rallied again the next day. The next three days $3.30 was the ruling price, but from May 28th to June 4th, inclusive, $3.27½ was the real quotation. On June 5th, 8th and 11th $3.25 ruled, while on the 6th lead was up 2½ cents, and on the 7th it was off 2½ cents from the three days named. Excepting on June 14th, when the base metal rallied to $3.32½, the settling price paid for lead deliveries in New York from June 12th to 19th, inclusive, was $3.30 per 100 pounds.

The Official Daily Market Report of the New York Metal Exchange, dated June 19, 1894, furnishes corroborative evidence of the manipulations complained of. The Report gives the settling prices for June, July, August and August deliveries of lead at $3.30 per 100 pounds; for September and October deliveries, $3.27½, and for Novemher, $3.25.

The New York quotation hy telegraph governs the price paid for ores by the smelters on the day assays are made. During the entire period from April 19th to June 19th the actual prices paid for lead in New York ranged from $3.45 down to $3.22½ and up to $3.30, hut all the while the quotation on the metal was sent out hy telegraph from New York at $3.10 per 100 pounds. On this latter hasis the lead-ore producers were paid for their product by the local and Eastern smelters, while in reality the ruling price was 20 to 35 cents per 100 pounds higher.

The manipulation of the quotations sent from New York hy wire is done by two hrokers, selected for the purpose, fixing the price of lead at $3.10 or $3.15 per 100 pounds, and the New York Metal Exchange agrees on these figures as the price smelters are to pay for the hase metal contained in lead ores. The assertion is hased on information hy the secretary of the Exchange.

A report on the production of lead in the United States during the first six months of '94, suhmitted to the United States Geological Survey by Special Agent C. Kierchoff, shows a heavy falling off in the quantity of the lead drawn from domestic sources.

The production of desilverized lead amounted to 86,772 net tons against 95,921 for the first six months of 1893; and of soft lead 15,610 tons net against 16,305 for the corresponding period last year. The total production of refined lead was 102,382 net tons against 111,926 in the first half of 1893, the refined in bond amounting to 21,392 net tons against 12,230 for the first half of last year.

The lead available for home markets aggregated 80,990 tons, including 9736 tons representing the contents of Mexican and Canadian ores.

From these sources the lead production netted 71,204 tons against 83,830 net tons during the first half and 80,506 tons in the second half of 1893. The stock of lead in refiners' hands amounted to 2655 tons on July 1, 1894, as compared with 2468 tons on Jauuary 1st. The stock of soft lead was 2060 tons in the heginning of the year against 1880 on July 1, 1894.

Treasury officials estimate that 60,000,000 pounds of lead will he imported this year from Mexico in silver ores. The old tariff was 75 per cent of its value; the new is 37½ per cent.

Quicksilver is quoted at £6 5s in London.

New York Prices.

NEW YORK, Aug. 23.—Following are the closing prices for the week:

	—Silver in— London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29¼	64¾	....	....	.....
Friday	30⅛	65⅜	9 15	3 20	19 60
Saturday	29⅞	64¾	9 20	3 25	.....
Monday..	30½	66	....	....	.....
Tuesday	30⅛	65½	9 15	3 20	19 50
Wednesday	30¼	66	....	....	.....

The local hullion, money and exchange quotations current are as follows:

Drafts on Sight, New York, per $100	12½c
Drafts on New York, Telegraphic	15c
Sterling Bills on London, 60-day Bank	$4.86¾
Sterling Bills on London, Sight	$4.87¾
Sterling Bills on London, Commercial	$4.88
Silver Bars, per ounce	65⅞@66
Mexican Dollars	53@54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	8½
Powdered, "	—	@	8¾
Concentrated, "	—	@	7½
COPPER.			
Bolt	23	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	17 00
ZINC.			
Sheet	8½	@	9
LEAD.			
Pig	—	@	4¼
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	5¾
SHOT.			
Drop, sizes *smoller* than B, per hag of 25 lbs			$1 55
Drop, B and *larger* sizes, "			1 75
Buck, Balls and Chilled, do, "			1 85
QUICKSILVER.			
Home trade, per flask	35	87½@	36 00
STEEL.			
English, lh	14	@	16
PIG TIN.			
Per lb	21	@	22

COAL.

SPOT FROM YARD—PER TON.

Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 75
Coos Bay			5 50
Cannel			8 75
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 25
West Hartley			8 25
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	7 00	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 75	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 00	@	— —
Egg, hard	9 00	@	— —
West Hartley	8 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	13 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, August 23, 1894.

The expected advance has not yet materialized, and despite daily favorable reports dullness pervades the street. Con. Cal. & Va., Union and Sierra Nevada had some life during the week; the majority of the stocks were in the dumps. Even the advance in silver conveys no huoyancy. Last Monday the Con. Cal. & Va. sold silver to a city hank at 66⅜, the highest since last Febrnary. The steamer China last Tuesday for Japan and China took over half a million in silver, including 283,478 Mexican dollars.

It is expected some of the Carson river mills will resume operations next week.

The following illustrates the changes of the week:

MINES.	23	30
Utah	$ 00	$ ....
Sierra Nevada	93	99
Union	69	73
Mexican	1 20	1 10
Ophir	2 30	2 20
Consolidated California and Virginia	4 30	4 05
Best & Belcher	1 35	1 25
Gould & Curry	58	72
Savage	36	65
Hale & Norcross	64	64
Chollar	27	25
Potosi	43	42
Bullion	.....	.....
Exchequer	.....	.....
Alpha	.....	09
Confidence	1 05	.....
Yellow Jacket	47	42
Crown Point	78	.....
Belcher	86	82
Overman	23	.....
Justice	24	21
Alta Consolidated	21	.....
Consolidated New York	.....	.....
Challenge	.....	36
Bodie	1 65	1 55
Andes	52	53

San Francisco Stock Board Sales.

SAN FRANCISCO, Aug. 30, 1894.

FIRST SESSION—9:30 A. M.

200 Belcher	82	50 Mexican	1 10
600 Bodie	1 55	350 Ophir	2 10
300 Best & Belcher	1 20	200 Potosi	42
100	1 15	300 Savage	59
100 Challenge	34	300 Sierra Nevada	99
100 Chollar	25	100 Yellow Jacket	42
300 Con Cal & Va	3 95	500	41
70	4 00		

SECOND SESSION—2:30 P. M.

150 Alpha	09	100	21
200 Andes	53	200 Kentuck	10
200 Best & Belcher	1 25	250 Ophir	2 15
50	1 20	250	2 20
400 Bodie	1 55	55 Mexican	1 10
100 Bulwer	18	700 Potosi	41
100 Challenge	36	450	40
500 C. C. & Va	4 05	100 Savage	63
100 Gould & Curry	72	100	64
150	71	300	65
100 Hale & Norcross	64	350 Union	73
200 Justice	20	200 Yellow Jacket	42

Recent Colorado Incorporations.

The Ajax Gold Mining Company, in El Paso county. Capital stock, $1,000,000.

Cripple Creek National Gold Mining Company, Colorado Springs. Capital stock, $1,000,000.

The Badger Mining & Milling Company, of Clear Creek. Capital stock, $125,000.

The Mount of the Holy Cross Gold Mining & Milling Company. Capital stock, $500,000.

Fish Creek Gold Mining & Land Company, in Arapahoe, El Paso and Park counties. Capital stock, $1,000,000.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Delinq't and Sale.*	*Secretary.*
Bay State M & D Co, Cal	22	3c	Aug 25, Sept 29, Oct 24	F E Luty, 330 Pine
Brunswick Con G M Co, Cal	7	2c	Aug 22, Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7, Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	30	20c	Aug 9, Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27, Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17, Aug 24, Sept 21	C C Harvey, 309 Montgomery
Oshorn Hill G M Co, Cal	3	15c	July 7, Aug 7, Aug 28	R R Grayson, 331 Pine
Overman S M Co, Nev	71	10c	July 17, Aug 21, Sept 11	G D Edwards, 414 California
Potosi M Co, Nev	42	25c	Aug 2, Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24, Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	20c	July 27, Aug 30, Sept 19	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18, Aug 22, Sept 11	E L Parker, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31, Sept 11, Oct 2	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2, Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	*Secretary and Office in S. F.*	*Date.*
Gold Mountain M Co, Cal	J E D Curtis, 325 Montgomery	Sept 4
Home G M Co, Cal	C Hessler, 16 Geary	Sept 1

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 21, 1894.

524,776.—EXPLOSIVE COMPOUND—G. J. Buechert, S. F.

524,777.—NIPPLE HOLDER—Jos. Canney, Butte, Mont.

524,539.—PAVING ROLLER—W. E. Dennison, S. F.

524,821.—FILTER—H. Eisuer, S. F.

524,779.—SAWMILL CARRIAGE OFFSET—C. Elridge, Oakland, Cal.

524,801.—GAS BURNER—H. Eischweiler, S. F.

524,894.—STRIKING BAG — C. A. Forsberg, New Whotcom, Wash.

524,901.—BOILER—E. C. Jordon, Sacramento, Cal.

524,721.—HYDRAULIC VALVE—T. H. Lee, Seattle, Wash.

524,947.—RAILWAY SIGNAL — A. B. Murray, San Rafael, Cal.

524,862.—HAY DERRICK—D. Ogilvie, Elko, Nev.

524 769.—DOOR OPENER—G. Rischmuller, S. F.

524,810.—DOOR OPENER—G. Rischmuller, S. F.

524,916.—CAN LABELING MACHINE — Tardif & Wethered, S. F.

524,923.—UMBRELLA LOCK—N. B. Whitfield, Portland, Or.

23,574.—DESIGN—W. H. Ward, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

NIPPLE HOLDER.—Joseph Canney of Butte, Montana. No. 524,777. Dated August 21, 1894. By the use of this holder what is known as the "leader screw" or "draw thread," and the set screws of the ordinary die stock, are dispensed with. This is by reason of substituting other means for directing and forcing the die on the nipple. These means are a holding nut seated on the end of the rod which passes through the stock, the nut having a shoulder equal in diameter to the exterior diameter of the nipple against which it hears. The shoulder is exteriorly threaded, whereby the dye when seated ou it is guided and forced directly upon the nipple. The holder is also adapted for the cutting of different sized nipples. This is effected hy suitable bushings and hy different holding nuts having shoulders of different diameters.

AUTOMATIC OFFSET MECHANISM FOR SAW MILL CARRIAGES.—Charles Elvidge of Oakland, Cal., assiguor of one-half to John D. Eby, of same place. No. 524,779. Dated August 21, 1894. The device consists of a cam or segment mounted on the carrier and having rollers within it which are freely rotatahle in one direction hut locked in the other, and power connections from the cam or segment to effect the offset and return of the carriage at the heginning of the jigging and feeding movements respectively. The objects obtained hy this invention are simplicity and durahility in construction, accuracy and effectiveness in operation, and particularly the advantage that, not being dependent upon the carriage axles, its action cau be relied upon to take place at proper times.

FRUIT CARRIER.—No. 524,568. Aug. 14, 1894. Edward E. Wade, San Francisco, Cal. The object of this invention is to provide a protective recepticle and carrier for fruit and other perishable articles to he used in conjunction with the exterior boxes or cases. It consists of independent compartments made of flexihle material coiled into cylindrical form at one end so that each will enclose an article of fruit, and these cylinders have projecting flaps or leaves extending heyond their junction with the compartments, so that the projecting flaps of any two will extend iu opposite directions and form a third compartment between each two adjacent ones. This compartment material is corrugated to render it elastic and to keep the fruit from heing bruised, and each series within the outer case is separated hy horizontal partitions having ventilatiug openings made through them.

ANHYDROUS AMMONIA PURIFIER.—No. 524,567. Aug. 14, 1894. Richard G. Sneath, San Fraucisco, Cal. This invention relates to an apparatus which is adapted to purify anhydrous ammonia under pressure. In the use of anhydrous ammonia, as illustrated iu ice-making and refrigerating machines, the ammonia hecomes gradually reduced in its effective action hy hecoming contamiuated with light gases or with water or heavier liquid which, in spite of all precautions, will hecome mixed and greatly interfere with the operation of the machines and reduce their capacity. This iuvention is designed to draw off hoth the gases and the water hy a simple connection with the pipes through which the liquid ammonia must travel. It consists of a vertically disposed chamber introduced hetweeu the lines of pipe which convey the ammonia and which join the chamher on different horizontal planes. The upper end of the chamher extends above the level of the inlet portion of the pipe, providing a space in the upper part for the gases which separate from the ammonia, while the heavier impurities and water will settle to the hottom and may he drawn off through a cock at the hottom of the chamber, while the ammonia itself thus purified passes out through an intermediate pipe or hranch. These various pipes, inlets and outlets are provided with suitable controlling cocks so that any one of them may be opened or closed at will.

LAMP HEATER ATTACHMENT.—A. H. Cowen, San Fraucisco, Cal. No. 524,667. Dated Aug. 14, 1894. The ohject of this inventiou is to provide an attachmeut for the ordinary illuminating lamp wherehy the heat from the lamp chimney is received and radiated so as to warm the air of the room. It consists of coucentric rings with a series of horizontally connecting wires formed with the bends holding and clasping the rings with proper relation to each other; the outer euds of the wires being hent upwardly, form holders for the lower eud of the heating drum, while the iuner ends terminate iu vertically extending downwardly opening hooks, which fit over the upper end of the lamp chimney and rest upon its upper edge whereby the heating drum is supported directly from the lamp.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

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(MACARTHUR-FORREST PROCESS)

MacArthur-Forrest Process.

CAPITAL, - - - £110,000 STERLING.

To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.

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OFFICE: MCPHEE BUILDING, DENVER, COLORADO.

California and Nevada Agency and Experimeutal Plant, 23 Stevenson Street, San Francisco, Cal. P. G. Gow, Sole Agent.

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A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which tendollar rock is now being crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

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For Sale
At Lowest Market Prices.

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100 California St., - San Francisco, Cal.

Adamantine Shoes and Dies
—AND—
CHROME CAST STEEL
Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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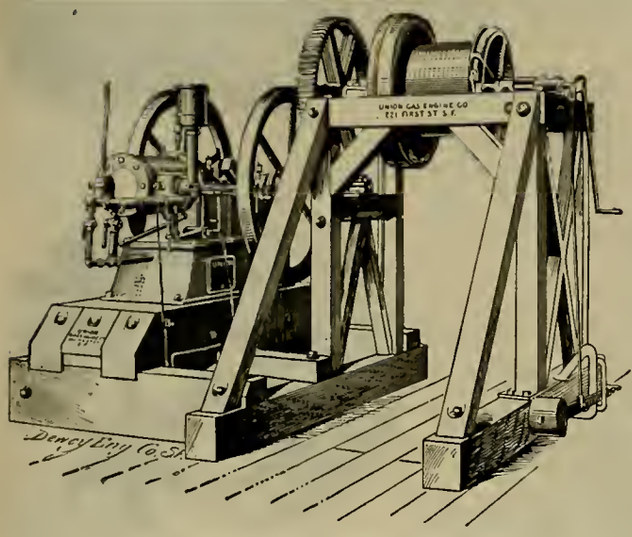
OF SAN FRANCISCO.
ROOM 1. - 426 CALIFORNIA STREET, SAN FRANCISCO.

PATENTS
DEWEY & CO.,
220 Market St., S. F.



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Pioneer Manufacturers
Of Gasoline Engines and Owners of Twenty Patents on Same.

ENGINES FOR MINING PURPOSES A SPECIALTY.

WARNING!
If you are in need of power for mining purposes investigate this engine and take no other. Many so-called gasoline engines are now on the market, which are direct infringements of our patents and it is our intention to bring suit against the various infringers. As the law holds the purchaser, as well as the manufacturer, we would advise parties who have already purchased other gasoline engines to obtain from the sellers of such engines a good and sufficient bond protecting themselves in case damages are obtained against them, as it is not the policy of this company to work a hardship on innocent parties, but the law makes no such provision.

Union Gas Engine Co.
SEND FOR CATALOGUE. 221-223 FIRST STREET, SAN FRANCISCO, CAL.

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CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.
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MINING AND MILLING MACHINERY,
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OVER 4000 IN ACTUAL USE.

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—o—

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(Successor to ADAMS & CARTER,)

AGENT FOR THE

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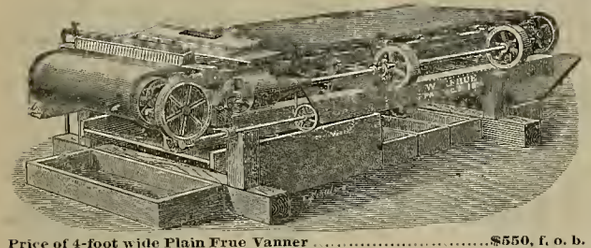
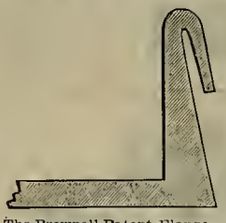
132 MARKET ST.,

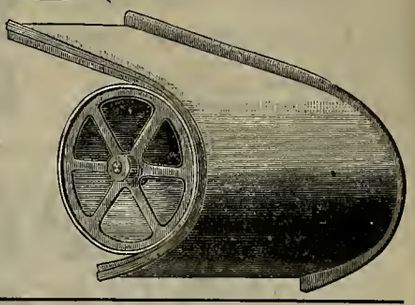
San Francisco, Cal.



Price of 4-foot wide Plain Frue Vanner.....$550, f. o. b.
" " " Improved Belt Frue Vanner..... 700, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 700, f. o. b.



The Brownell Patent Flange.



THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891. MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. **Price $575 f. o. b.** Send for Catalogue and Testimonials. The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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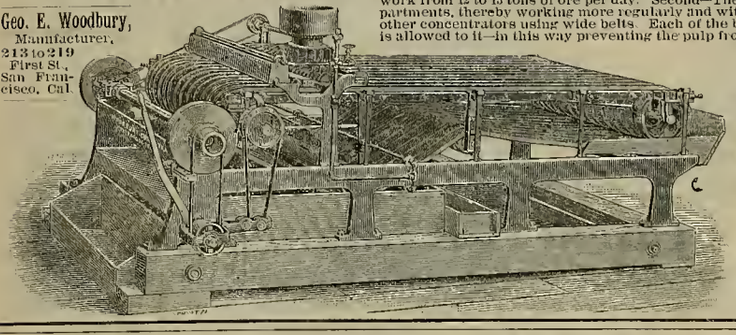

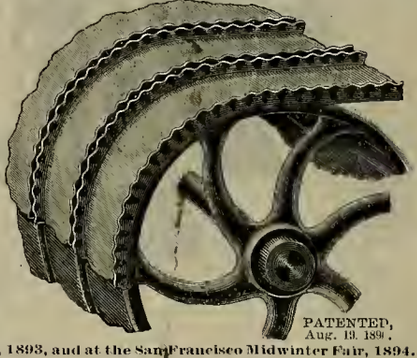

PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

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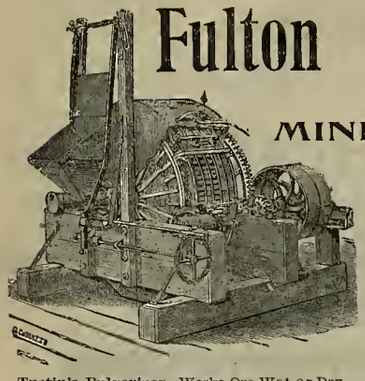

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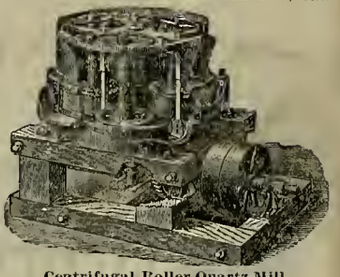

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VOLUME LXIX. Number 10.

SAN FRANCISCO, SATURDAY, SEPTEMBER 8, 1894.

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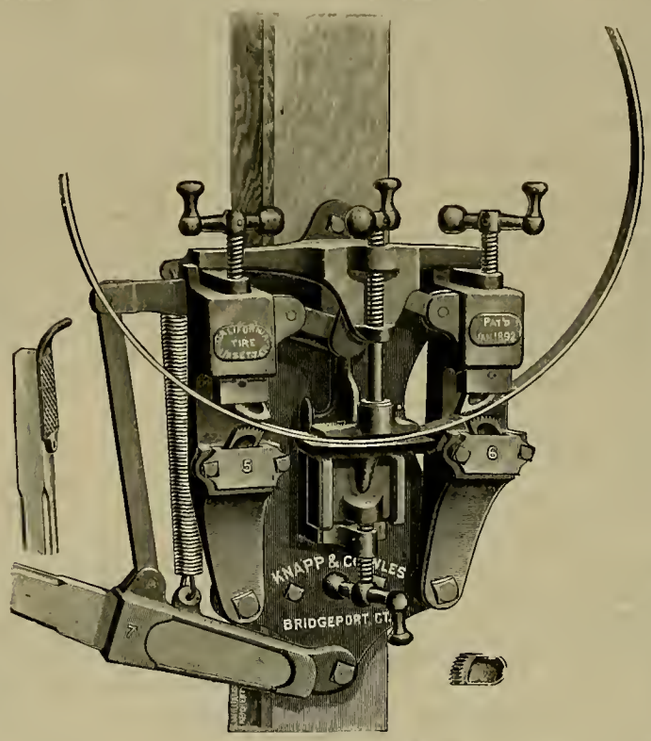
First Stamp Mills.

Inquiry being made for data regarding the first stamp mills erected in this State, it appears from "The First Quartz Mill in California; Sketch of Nevada County, 1856," by A. A. Sargent, that "The first quartz mill was built in January, 1851, on Wolf creek nearly opposite the present Empire mill, by two Germans for Mr. I. Wright. The mill (a water mill) was a small affair and not successful, but it was the *second* one built in the State, the first mill being built in 1850 in Mariposa county, which also proved a failure."

The "Directory of Grass Valley Township for 1865," by William S. Byrne, says: "The French mill is situated on the west side of Wolf creek, Grass Valley. It was built in January, 1851, by a couple of Germans for I. Wright. This mill, the second one constructed in the State—the first being built in 1850 in Mariposa county—was a common affair, run by water power, having *eight round* stamps each in a *single* mortar."

The "eight round stamps" are believed to be the first revolving stamps. The first successful quartz mill in California was built in the winter of '50–'51 by Sowers, Abby & Ridgell. It was a steam mill. A few months later Judge Walsh built a mill there, which he sold to Crossett & Collins. About the same time Conway & Preston built the New Helvetia mill, Col. Richardson built one and the Mount George Company put up a third.

In the summer of '51, Commodore Stockton built a quartz mill at Grass Valley, and another at Mariposa, the crushing being done on the principle of a pestle and mortar, the cam being so arranged as to partially revolve them, a separate mortar being provided for each "stamp" or pestle.



CALIFORNIA TIRE UPSETTER.

California Tire Upsetter.

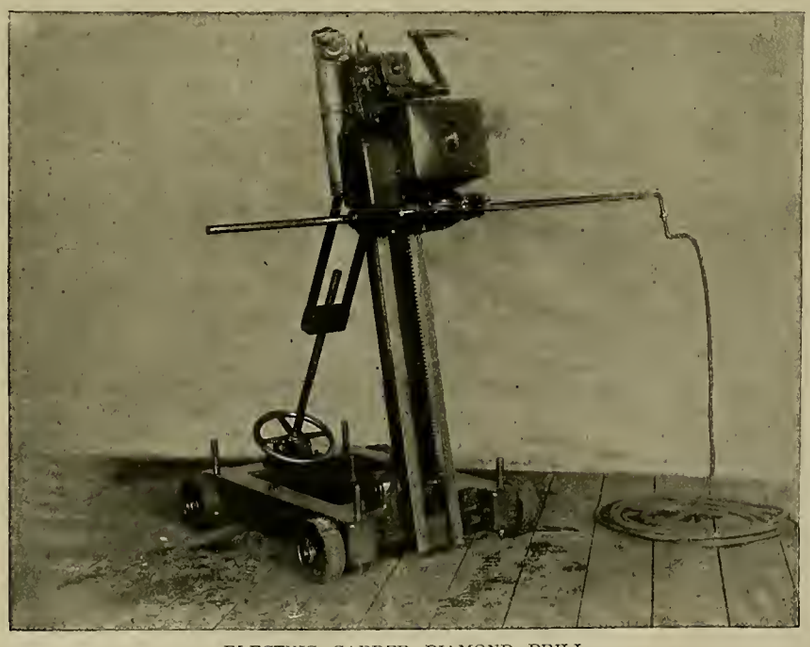
On this page is illustrated the California tire upsetter, made by Knapp & Cowles, Bridgeport, Conn. With this machine tires can be shortened without cutting and without a hammer. It works with perfect ease equally well on light and heavy tires. When not in use the handle can be removed.

In operating, the lower center plate is adjusted to conform to circle of tire. The tire is placed in position, the center plate screwed down, then the jaws, so as to grip firmly on both sides. If properly adjusted, there can be no slipping when force is applied to the handle, which is done by the left foot, leaving the hands free to use as required. In this way you can get two or three compressions in one heat. Bar iron can be upset by adjusting the center plate in line with the work.

To set for use, it is necessary that the post has a true face. By boring a hole for the top bolt three feet eight inches from the floor and with the two bolts below secured firmly, but not too rigid, it is ready for work.

Electric Gadder Diamond Drill.

An adaptation of quarrying by electricity is the electric gadder diamond drill recently put out by the General Electric Company This machine is of two K. W. capacity. The table on which the actuating mechanism rests can be inclined at any angle with the floor, and allowed a travel of seven feet parallel to its face. In addition, the drill can be so lowered as to drill within two inches of the rock bed, and by a change in the driving and nut gears, the automatic feed may be adjusted to the nature of the rock. The motor is provided with a reversing switch, which, with a proper arrangement of gears, makes it possible to cut into a corner in either direction, by reversing the feed screw in the feed device—that is, the gadder can cut either to its right or left side. It is provided with a quick return mechanism. While cutting into the rock, the drill is fed slowly—in marble the speed is about one foot per minute. When it has reached the desired depth it can be given a quick back feed by the simple movement of a lever. The motor is of the iron clad, waterproof and dust tight type. The end thrust of the feed screw in both directions is taken up by the ball thrust bearings. The drill rod can be made of any reasonable length up to twelve feet.



ELECTRIC GADDER DIAMOND DRILL.

E. E. Nesbitt, of Adelaide, has a new method of treating slimes which he considers effective. It is a reversal of the ordinary mode of using blankets in the treatment of heavy concentrates from mineral ores. Instead of passing the tailings over a table covered with a blanket, short lengths of blanket are suspended over the floor of the race or table in such a way that the water, as it flows over the surface, passes beneath the suspended blankets, which trail on the surface of the flowing water. This process of treatment is only applicable to mines where there is a large percentage of float gold, which is ordinarily carried away in the tailings.

A Denver dispatch says San Francisco is paying $1 an ounce more for gold than Colorado points—an unlikely story in fact, though there is gold and gold; some gold is worth a dollar an ounce more than would be paid for other kinds.

The Anchor Mining Co. of Park City, Utah, is defendant in a $25,000 suit by the wife of James Linden, who asks damages in that amount for her husband's death, the company being alleged to have been negligent.

The "overproduction and want of consumption" statements, so common, do not apply to gold. In this regard it would be interesting for some of our agricultural friends who decry mining to reflect for a moment on what the probable present condition of this State would be had gold never been discovered in this State.

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Our latest forms go to press on Thursday evening.

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San Francisco, September 8, 1894.

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THE *Herald* suggests that a Miners' Club be organized in Nevada City for mutual benefit and to supply the wants of visiting capitalists, etc. Such an institution could be made of present and permaneut value in illustrating the resources of the county, as well as being a social organization.

THE Award Committee of the California Midwinter Exposition announce that the bronze medals of award can now be had upon application; that solid coin gold medals can be procured by payiug $80 each, and solid silver medals at $9.50 each, which, under the circumstances, appears to be reasonably dear.

THE general statement iu most papers published in mining towns that "'tis useless to come here lookiug for work: the camp is full of unemployed men," is not found in the Telluride, Col., *Republican*, which declares that miuers are needed there and that the demand is greater than the supply.

SEC. GRESHAM and the British Minister resident at Washington have agreed to have a commission meet at Vancouver, B. C., to decide upon the amount the United States Government must pay in damages for the twenty Canadiau sealers seized more than a league off shore in Alaskan waters. A conservative estimate places the amount at $600,000.

T. A. EDISON is reported to have spent nearly $2,000,000 at Ogden, N. J., in his magnetic process of refining iron ore. He proposes to dispense with smelting, and, by a cheaper process, separate the iron from the non-metallic accompaniment by means of magnets. He has done so mauy wonderful things that his financial backers feel fully justified for the faith that is in them.

SILVER holds its advance, and the object lesson given the couutry in the universal dullness aids in the realization that that metal must be remonetized before permanent financial improvement cau take place. Fine-spuu theories of fine-haired professors must give way to public demands, and bimetallists are strengthened by the steady change of thought throughout the world.

FROM the Broken Hill Proprietary Co., Limited, of New South Wales, is received a report of the mine's workiugs for the six months ending May 31st, '94, which illustrates the immensity of its workings. Though the white metal is so depreciated iu price, this big mine paid a uet profit of £397,378 7s 1d for that six months. It cost £2 12s 6d per ton to treat the ore, of which 257,278 net tons were extracted in the one-half year, producing 7,287,337 ouuces of silver, 25,638 tons of lead and 441 tons of copper. This is an average output per week of 280,282 ounces of silver, 986 tons of lead and 17 tons of copper, au average of 30 ounces of silver to the ton of ore. There were 3352 employes. There was a profit of £1 9s 6d ou each ton of ore treated, the uet amount received during the six months from sales being £1,104,216 11s 5d. A foot note on one of the pages says: "The strike disarrauged costs and profits for this one-half year."

THE month of August was a dreadful one for accidents in mines. Despite all that precautiou, intelligence and safety devices can do, the anuual death list caused by miniug casualties is a dreary one, and the finaucial loss mounts into the millions. On the earth's surface one can ordinarily take care of himself; undergrouud he is at the mercy of his fellow-workers, and carclessness or incompetency wreak fearful results. A great proportion of last month's accidents were, as usual, occasioned by explosions iu coal miues.

WITH wine at ten cents a gallon, delivered in San Francisco, wheat at fifty cents a bushel, and wool at four ceuts a pound, our agricultural brethren of the State must think the gold miner has a little the best of the situation, that commodity being in constant demand at top figures. Fortunate, indeed, is the commonwealth in these dull times that can produce the gold whose possession eases the financial pressure, and short-sighted are those of its citizeus who strive to hamper the great mining industry that is the present life of the State, as it was the original source of its beiug.

SOUTHERN CALIFORNIA papers believe that that part of the State "is on the eve of a petroleum boom." There ueed be nothing "boomy" about the development of petroleum in this State, for it is as legitimate and conducive to profit as auy other form of mining. The oil wealth of the State should be developed, and doubtless will be. Considerable has been done in Los Angeles county; considerable more can be done in Ventura. State Mineralogist Crawford recently sent a competent represeutative to make a thorough examination of the oil belt in that section of the State, which extends northwest and southeast through the counties of Santa Barbara, Ventura and Los Angeles. His report will be shortly forthcoming.

THE annual report of Commissioner of Patents Seymour shows that during the past fiscal year there were 35,952 applications for pateuts, 1050 for designs, 108 for reissue, 2193 caveats, 1720 applicatious for trade-marks and 368 for labels. There were 21,496 pateuts granted, including reissues and designs; 1656 trade-marks registered and 2 prints registered. The number of allowed applications which were by operation of law forfeited for non-payment of the final fees was 4566. The total expenditures were $128,561. The total receipts over expenditures not placed to the credit of the patent office in the treasury amouuts to $4,409,367. The receipts show a falling off of $105,286 from the previous year, and expenditures decreased $57,481.

SPEAKING of the Golden Age, the *Mining Journal* says: "The past, when viewed through long vistas of years, becomes bright with the glamor of time—time that leuds dignity to an uusightly mound and luxuriance to a duug-hill. Historians, by the aid of imaginatiou, which they in common with poets, company promoters aud artists skilled in the mysteries of prospectus writing use extensively, have pictured for us successive golden ages in the annals of the world, but the present is iuvariably far removed from the gilded periods portrayed. After all, we suspect it is only gilt that glistens through the avenues of time. There never was a golden age in the actual past in either a moral, material or miueral sense. From a mineral point of view the present age is comparatively more golden thau any which has preceded it. To-day it is either gold or nothing. Silver pales with shame at the price to which it has fallen; copper loses its ruddy hue when it remembers it used to be four times its present value; lead is heavy and depressed with its owu weight, and with the fact that to miners it is an unprofitable commodity; even tin shines with dimiuished luster wheu it recalls the old prices paid per ton for its silvery-looking ingots; and iron, influenced by the inactivity of its markets, joins in the metallic gloom, and wears a look of chronic rustiness. In short, 'gold is on the boom.' This is the age of gold, and every legitimate effort to increase the world's store of the bright yellow metal should be encouraged. Commerce craves for more gold; men of all uations and creeds hunger aud thirst for it. Leather circles have ceased to be counters for value; cowrie shells are obsolete as currency except in beuighted lands; copper is no louger legal teuder; and GOLD, GOLD, more GOLD, is the universal cry. We live in the Golden Age."

EDITORIALS on "the approach of the 20th century," plentifully appearing, suggest that our chronology is a scanty one, the merest fragment of a mighty record, and a thought of curiosity as to what the total would now be iu figures had it been possible for man to keep a correct tally of the years. Several times the attempt has been made, starting from some notable epoch, but after running up to 3600 or 4700, came some cataclysm that broke off the count and theu the chronicle began all over again. The Chinese have a connected chronology of several thousand years, alongside of which our little 1894 looks small, but even theirs is but fragmentary. Probably after our A. D. has reached 2600 or so, will come some era deemed worthier to date from, and the people who are waiting to be born iu that far-ahead time will start the count anew, beginning with the year 1 again, as has been done so many times before since first humanized apes found it convenient to note the recurrence of the earth's annual journey around the sun.

THE Salt Lake *Tribune* thinks the mining men of Utah should begin to make arrangements for the new Constitution. The gold and silver miners especially ought to see that nothing inimical to their interests finds its way into that Constitution. In most countries a reward is paid to a man when he finds a precious metal mine. That at least used to be the rule. The rule in our couutry is that if a man finds a mine and reaps a little more from it than the expenses of ruuning it, he has to be a wonderfully good man to avoid the criticism which seems to be on the lips of a great many people, that down deep he is a robber. There must be no clause in that new instrumeut to cripple iu any wise the legitimate pursuit of mining, because it is from that that Utah must expect her future prosperity. That is, the product of the mines that must supply her people with that lubricating fluid of commerce which is called money. The first Constitution of the State of Nevada was defeated solely because there was one clause in it which the miners of that State thought was inimical to their interests.

SELDOM has a prophet honor in his own or any other country, so it is with pardonable pride Ernest Seyd recalls the fact that just twenty-three years ago, at the time when the demonetization of silver was first proposed in Germany, he predicted, should such action cusue, "a fall of gold prices, and a consequent depression iu all trades aud industries throughout the world." In the light of recent events, still more remarkable is the reading in '94 of his prophecy in '71 that "the strong doctrinism existing in England as regards the gold valuation is so blind that wheu the time of depression sets in there will be this special feature — the economical authorities of this country will refuse to listen to the cause here foreshadowed. Every possible attempt will be made to prove that the decline of commerce is due to all sorts of causes and irreconcilable matters. The workman and his strikes will be the first convenient target." All the British and some of the American journals are to-day attributing the universal financial staguation to "the workman and his strikes," when as a matter of fact they but confound cause and effect. The strikes, like the fall iu prices, are but results. The papers that say "the workman and his strikes" are the cause of the depression used to claim that there would or could be no reduction of wages. Now that there has been a tendency to reduction they must fall back on some other explanation. Meanwhile Seyd's prophecy is fulfilled. It looks uow as if the next big strike would be on the part of capital.

Concentrates.

THE Comstock August payrolls amounted to $89,469.17.

THREE DOLLARS per shift is the ruling wages in the Mercur mine, Utah.

THE Alaska-Treadwell G. M. Co. paid $450,000 in dividends last year.

THE Summit Mining Company is about to build a mill near Sutter Creek, Cal.

AT Silver Star, Nevada, the Douglas Company's mill has started up again.

THE work of sinking for greater depth at the Virtue mine, Oregon, has begun.

THE Grass Valley Miners' Union is now reported to have nearly 500 members.

THE Morning Star mine of Iowa Hill declared a dividend of $2 per share last Wednesday.

THE Moser and Linderaxa mines, at Mokelumne Hill, are enjoying an era of prosperity.

THE Oak Tree mine hoisting works at Maybert, recently destroyed by fire, will be rebuilt.

THE borax plant, thirty miles south of Kennedy, is shipping the refined product to the railroad.

A $40,000 FIRE at Angels Camp last Monday burned one-half a block in the business part of town.

IT IS expected that the new Pilot Boy smelter in the Kootenai country will begin operations this month.

ON the Snake river near Adkins, Oregon, Chinese have discovered placer mines which pay from $5 to $8 per day to the man.

ARTICLES OF INCORPORATION of the Oak Tree Quartz Mining Company have been filed in Nevada Co. Capital stock, $100,000.

THIRTY-EIGHT MEN are employed at the Phoenix mine, Sierra City. The ten-stamp mill will soon be changed for one double that capacity.

COLORADO exchanges think that this year's output of gold and silver in that State will be $27,000,000—$15,000,000 gold and $12,000,000 silver.

THE cleanup at the Mercur, Utah, mill for the first half of August was over $18,000. The proposed 200-ton mill will be built the first months of '95.

THE Chaparral Hill mine, near Angels, Cal., is reported bought by an English, Boston, New York and Chicago syndicate, who will build a 100-stamp mill.

ALASKA is to have another 200-stamp mill, it being the intention to put one on the Ready Bullion and Golden Chariot claims near the Mexican mill on Douglas Island.

THE Grass Valley miners have passed resolutions requiring Assembly candidates to pledge support to a bill to abolish compulsory trading at the stores of mining companies.

A STATEMENT by the director of the Mint shows that the coinage during the month of August was: Gold, $7,722,000; silver, $976,000, of which $748,000 was standard dollars.

THE Salt Lake Copper Manufacturing Company have produced about 150 tons of copper matte, which is still waiting to be put through the reverberatory and casting furnaces.

THE New York Hill Gold Mining Company has applied to the court for permission to dissolve as a corporation. The money remaining on hand will be divided among the stockholders.

THREE years ago W. S. Stratton of Cripple Creek, Col., was working for $2.50 a day. He is worth $3,000,000 in coin and expects to get more out of his mine which he discovered himself.

THE Amador *Dispatch* hears that work will be resumed on the Gover mine, near Drytown. Suits now pending will be suspended until the company can get squarely on its feet again.

THE Soap Root, Wild West and Lone Star mines, at West Point, have made great strikes recently and that town is enjoying a mining boom which makes its people think of old times.

H. S. BLOOD of Bear valley, in Alpine county, has sold the valley to T. Bishop of this city, who will use it for a reservoir to collect water to be used in mining near Vallecito in Calaveras county.

THE total gross output from the Mendota, Col., group of mines for the first seven months of this year foots up $30,258.45. As compared with the same period for 1893, this is a falling off of over 200 per cent.

WORK has been begun by the Montreal Company on their property across the river from Robinson's Ferry, Calaveras county. Forty men are now employed, and the number will shortly be increased.

THE Marguerite Gold Mining and Milling Company has been incorporated in this city by George Schmitt, George Schafer, Henry Keifrich, F. M. Freund and Charles Peach, with a capital stock of $500,000.

TEN claims, close to the Ibex, Detroit district, Utah, have been sold to St. Paul men for $45,000 cash. The vein is said to be "sixty feet in width at the surface." The Ibex was recently sold for $135,000.

JOHN AND D. H. COLIS recently organized the New York Company in New York, with a million dollars capital. The company has bought eight mines in Tuolumne, the last purchased being the Seminole, for which was paid $125,000.

CHAS. HARVEY, now in this city, was recently sent from England to report on the Palmetto mines in southern Esmeralda, Nevada. He has sent his report, which, if favorable, will result in active operations beginning in January, '95.

A BOISE, Idaho, dispatch says a very rich gold ledge has been discovered on Willow creek, fifteen miles from there, two and one-half feet of ore being stripped for 300 feet, its value being variously estimated from $1000 to $2000 per ton.

THE coal-miners' strike at Belt, Mont., has ended by the companies closing down all the mines, stores and boarding houses, and stopping work on the new coking plants and railroads. The officers say that the shutdown may be permanent.

ON August 31st the Mercur (Utah) Mining Company declared its bi-monthly dividend of $25,000—12½ cents per share. That is the sixth dividend, and the company says it has prospects that assure the declaration of many times six more dividends.

THE Nevada *Herald* says the gravel borer which was put in the Derbec mine a few days ago is working finely, and the results are better than the owners expected. The mine is looking well and a good force of men is employed, both day and night.

EVEN floods are not without their blessings. S. N. Hinman is now taking from $2 to $4 daily from a flat owned by him just below the Kettle Falls of the Columbia. The high water threw up enormous bars, which are said to be exceedingly rich in gold.

THE Rawhide mine, Tuolumne county, is not for sale for $1,750,000. The owners have too good a property to sell for that figure. The present monthly yield is reported to be $75,000. Chlorination works are building, with a capacity of four tons a day.

MESSRS. MILLS, WATTS AND MENDENHALL, representing a syndicate of Chicago capitalists, have located a gravel mine near Comanche. They have a new washer, which they propose to work on this claim, and which they assert can handle and wash 1000 cubic yards of dirt per day.

NOTICE has been received at the Denver branch mint that the new toughening plant has been shipped to Denver and will be ready for use by the middle of next month. This addition to the mint plant is intended to give the final hardening to the refined gold, preparing it for coining.

THOMAS EVERSOLE, Archie Dowell, Hugh Guy and Charles Proctor, miners, were killed in the Amethyst mine at Creede, Col., last Saturday by a fire, which burned the shaft house and caused the skip to fall upon them. The loss by fire is $20,000. The mine is now filling with water.

THE Nevada *Transcript* says: Two mules have been lowered to the 1600 level of the Maryland mine, and will be used to haul cars. They will take the place of carmen, and it is said will materially reduce the running expenses of the mine. A stable 14x16 feet has been built underground for the mules.

THE Alaska Mexican Gold Mining Company reports its cleanup for July as follows: Period since last return, thirty-one days; bullion shipped, $15,651; ore milled, 6256 tons; sulphurets treated, 100 tons; of bullion there came from sulphurets $3181. The working expenses for the month were $12,472.

THE Herrold mine, on the Mokelumne river, Calaveras county, has been bought by S. Bell of Oakland. Ten men are employed putting the mine and mill in order for permanent work. It had been closed down for several months. The former owners were caught and went under when the Pacific Bank closed.

THE Columbia Mining Company has been organized at Seattle, Wash. It has purchased 640 acres of land opposite Yale, B. C., and has begun hydraulic operations there. It paid $28,000 for the property. Water will be carried across the Fraser river on a wire suspension bridge at a cost of $50,000.

COMPLAINTS are made, says the Cripple Creek *Miner*, that the smelters only pay $19 an ounce for gold. When the treatment charges are cut down, the price for gold is also cut. On high-grade gold ores (five ounces and over) $19.50 is paid, but the smelting charge is greater than on the lower grades where $19 is paid for the gold.

THE Colorado Mining Company of Sonora will get in the former Cerro Blanco railroad between their mines and Torres station, a distance of fifteen miles. The Cerro Blanco mines are a failure, and never produced a pound of ore, although over a quarter of a million of dollars were put into expensive machinery, railroads, etc.

THE Cœur d'Alene has shown the advantages of concentration; the Homestake the way to reduce sulphurets by chlorination; Cripple Creek by concentration and smelting; the Mercur by cyanide; Denver by utilizing sulphur for fuel; the Witwatersrand by plates, concentration and cyanide, and so on down the list, while Nevada clings to pan amalgamation.

KING & WILTSIE, owners of the Mother Lode gold mine at Murray, Idaho, ask an injunction against the Treasure Box Company from further interfering with the working of the Mother Lode mine, which was shut down by the turning off of the water by the Treasure Box owners. The Mother Lode is said to be paying between $500 and $800 per day when in operation.

THE Seth Cook group of gold mines at Coulterville, Mariposa Co., have been sold to Boston and Montana men, who own forty-four mining properties near Butte, Mont. The price was $100,000. It is intended to expend over half a million for requisite machinery, including a 200-stamp mill, which will be built on the Merced river, an electric road running from the mill to the mines.

REPORTS from Chile say that in Coquimbo the gold fever continues unabated. Andacallo is not the only place where gold has been struck. It is also reported found at Cruz de Canas, in a virgin state, and also in the province of Ancud, where sixteen men recently obtained $8000 worth in as many days. The gold is said to be very fine. A rush has set in from all parts in consequence.

CONSIDERABLE activity is reported at Perris, Cal. The Santa Rosa mine has been sold recently for $400,000. It is working a ten-stamp mill and taking out $20,000 to $25,000 a month in gold. There are two new mills being put up, and these will be followed by others. At the present time there are in the neighborhood of 300 men employed in prospecting, working in the mines or employed about the mills.

CALAVERAS COUNTY doesn't propose to be behind in announcing novelties, and furnishes in the Starlight mine, between Old Gulch and El Dorado, a wonderful tale of discovery. Near the bottom of a 125-foot shaft has been struck a seam of porphyry which supplies a strong stream of water "highly colored, being nearly as yellow as gold and plainly holds considerable of that precious metal in solution. It is ice cold and very palatable. Several of the men at work on the mine were formerly in the habit of getting full of whisky at every opportunity, but since drinking freely of this water they have no desire for liquor of any kind and are truly as completely cured of the liquor habit as though they had taken a course of treatment at the gold cure." This is plainly a case of gold cure.

FARMERS in Lincoln county, Washington, are annoyed by too much gold, the placer miners on the banks of the Columbia washing out the yellow metal in the shade of the apple trees. In locating their homesteads the agriculturists must swear that no part of the "legal subdivisions" is valuable for mining purposes, which, under the circumstances, is a little difficult to do and tell the truth. The matter will probably be referred to the Secretary of the Interior.

IN December, '93, E. A. Stent, W. B. McDougall and J. L. Whitney of Tuolumne Co. took a bond on the Mammoth mine, one of the Morton lode properties, near Jacksonville, twelve miles southwest of Sonora. They did some development work, showing its value. Last Wednesday they sold the mine to the English owners of the Sierra Buttes and Plumas-Eureka mines for $80,000. The new owners expect to build a fifty-stamp mill and employ eighty men.

IN the North Fork mine, Sierra county, work has been resumed, and it is expected this famous old mine will duplicate its bullion record. The present owners have 1200 acres on the old Bald Mountain channel, besides extensive timber lands and valuable water rights. It it thought that a tunnel 2800 feet in length will bring them to pay dirt. The channel they are running for is known to be very rich, the old Bald Mountain Company having taken out hundreds of thousands of dollars.

NEARLY fifty per cent value of the 2500 tons ore crushed at the Morgan mill from the Comstock in August was gold. Wherever the vein narrows there is an increase in the percentage of gold yield, iron pyrites making their appearance. It is now thought that the large areas of low-grade ore in the Comstock can be treated so that ore yielding only $8 a ton can be worked at a profit. Such a deposit as that in the Chollar mine should be of value. The Crown Point is illustrating what can thus be done.

THE *Star* of Johannesburg, South African republic, gives the results of operations in the Witwatersrand gold district for June: From mills, 108,007⅔ ozs.; from concentrates, 7032½ ozs.; from tailings, 48,800 ozs.; alluvial sluicing, 127 ozs.; other sources, 4195⅛ ozs. The values were respectively £390,340, £26,728, £140,361, £460 and £14,682, making an aggregate of £578,371, or about $2,800,000. The mills with an aggregate of 2250 stamps crushed 228,888 tons, the number of tons per stamp per day being 3.76, and the average yield per ton being a little over $8. Of tailings, 220,507 tons were treated with an average of $3.

THE Vanderhilt, Cal., *Shaft* has suspended and the editor departed for Utah. He left the following notice pinned on the office door: "The *Shaft* is sunk. Development work has closed, for no success has attended our efforts to find the pay streak. To our enemies we say: If you can get any comfort out of the failure of one whose efforts are and have been entirely for the good of the camp, just take it and may you be happy. To our friends we say: Good luck to you, and please accept our thanks for what you have done for us. To all, our friends and our enemies, those we owe and those who owe us, we say—Adios."

THE Prescott, Arizona, *Courier* says the old theory that Arizona gold mines "don't go down" is now thoroughly exploded. The trouble has been that a system of pocket mining has prevailed and the pocket miners did not go down after the ledges which happened to jump off a few feet. Of late years a few men have started an era of deep mining in that vicinity, and in no single instance has there been a failure in a gold mine proving as rich or richer than on the surface as depth was reached; and it has also been demonstrated that the surest way to get a mine is to take up one of these worked-out surface gold pockets and sink for the ledge. Some of the richest discoveries made in the last few years have been made in just this way.

THERE is no getting at the output of bullion in that section of Arizona around Prescott, as the utmost secrecy is maintained regarding its production and transportation. As an illustration of this, the following incident serves: A short time ago, as a reporter was making his daily round of the town, he happened to walk some distance behind a seedy-looking man who carried a half-grown satchel which accidentally became unclasped and flew open, revealing to his astonished gaze a large gold brick worth several thousand dollars. The man was taken by surprise and stated that the gold came from a mill and mine a few miles from Prescott, but begged that nothing he said about it, as he had already been shot at on a previous trip.

PRIMITIVE methods of gold mining are reported from Sinaloa, Mexico, where the natives work only in dry weather, sinking rude shafts from eight to sixteen feet to bedrock, and panning the gold in the crudest method, though making from $2 to $5 per day. The merchants there who buy the gold, which is mostly coarse gold, are reported to place the precious metal in one side of a pair of scales, while the other side is filled with grains of corn until balanced. A calculation is then made which is very much against the poor Indian—one grain of corn equals one grain of gold. In this way the merchant gets the gold at less than $7 per ounce, and payment is made therefore in Mexican silver, which is there quoted at thirty cents per ounce.

JULIAN SONNTAG, general manager of the Giant Powder Company, Consolidated, tells the *Journal of Commerce* that the powder business has been remarkably good, and this is a surprise owing to the unfortunate condition of affairs that exists in silver-mining districts, where the amount of work done has been very materially decreased; but this has been offset by the numerous gold mines that have been discovered and are being profitably operated. The revival of railroad building has helped trade, and more is being done in that direction than any time during upward of two years past. This will probably require a vast amount of giant powder for an indefinite future time. Prices are low, owing to heavy competition, and they will probably hold their own.

ONE thing which throws a doubt in the minds of conservative miners as to the value of new camps is the flush announcement that Smith has struck it big on Gizzard gulch, and that Brown has already taken up a townsite at the mouth, and is laying off lots. Now Smith's discovery, if of value, is alone valuable for the mineral it contains, and he has to show up something more tangible than surface cropping or pan washings to prove its permanence and value as a stable enterprise. Other valuable claims will have to be proven satisfactorily as coming producers. When this is done the camp is solid and the townsite matter will have been happily regulated. A simultaneous announcement of a rich strike and a townsite location is generally a fake so far as both are concerned.

Methods of Mine Timbering.

NUMBER III.

When the ground has a tendency to thrust itself up in the bottom of the shaft, the plan of planking and bracing the ground is sometimes resorted to. (The same principle is applied in drifting, when the method is referred to as "carrying breast boards.") In this method lagging is driven down in advance of the sinking, being supported in position above by a frame of timbers, either permanent or temporary. Planks are laid on the bottom of the shaft, being secured by upright posts, which abut against strong stulls or cross-pieces firmly wedged above. When the pressure from below begins to exert itself, a board near the center is removed and the soft, pulpy mass allowed to force itself upward. The material is removed until the ground is eased somewhat, when a second board is removed, the first being replaced somewhat lower than before, and again secured; the material coming up through this new space is removed as in the first instance, and in this manner work proceeds entirely across the excavation. The process is slow and requires considerable timber, but it is a plan which may prove successful when all others fail.

The method of driving lagging in shafts is similar to that explained under the head of drifts.

In some instances iron caissons have been sunk outside or inside the timbers to enable miners to pass through very loose, watery ground and quicksand. Where this is not absolutely necessary, wet places have been passed through by making a clay lining between two layers of close planking. It may be from two inches to one foot in thickness, according to requirements. It has been successfully employed in passing through quicksand and watery, loose ground.

In very bad wet ground the idea is to form a caisson-like structure with lagging, the interior being sustained, as explained above, by massive timbers, so placed as to resist the pressure of the surrounding rock mass. The exigencies of each particular case must determine the course to be pursued.

The expedient of freezing soft, wet, running ground, quicksand, etc., is now much resorted to with great success. It is a patented process, but finds general use where applicable.

Circular shafts are seldom sunk in America now, though very common in the early days in California. There are circular shafts all through the old river-bed region, which pass down through the tufa capping without a single stick of timber from top to bottom. Many of them are over 250 feet in depth, and, notwithstanding they were made more than forty years ago, are still in good condition and likely to remain so for a century. The rectangular shaft is the most common form in this country. "L" shafts do not find much favor and have nothing to recommend them. The size and number of compartments of a shaft must be determined by the amount of hoisting expected to be done through it.

Guides in shafts where cages are used, or where skips run on guides, should be so joined that there is no likelihood of warping or projecting, and jam the cage or skip, which is a most dangerous thing and a great strain on the cable. The overlapping of the ends has been for years a common practice, the two ends being secured at the ovelap by a single lag bolt. An improvement has been made on this plan, with a view to greater safety, by joining the adjacent ends of sections with a simple tongue and groove, like ordinary flooring or wainscoting. The ends each have a lag bolt, which makes them doubly secure. The drawings show both styles for framing guides. Spikes or nails should never be used, as it requires much more time to remove a section when repairs are necessary. Guides are most easily repaired by laying a secure platform in the compartment at the point requiring repairs, the men working upward from set to set. Should the whole shaft, or any large portion of it, require new guides at any time, the platform should be put in as described. The hood is removed from the cage and a bottom of loose boards laid on the floor. The workmen at the platform unscrew the lag bolts and take out the old, worn guides. The cage being lowered to the proper point, the old guides are passed up through a hole made in the bottom of the cage and the new guides passed down in the same manner and put in place. In this way the guides may be removed for a thousand feet in a single day by a gang of good workmen. Other repairs in the shaft may be made in a somewhat similar manner.

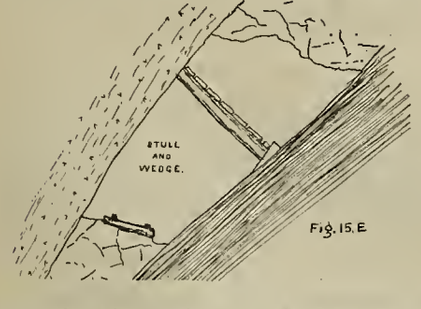
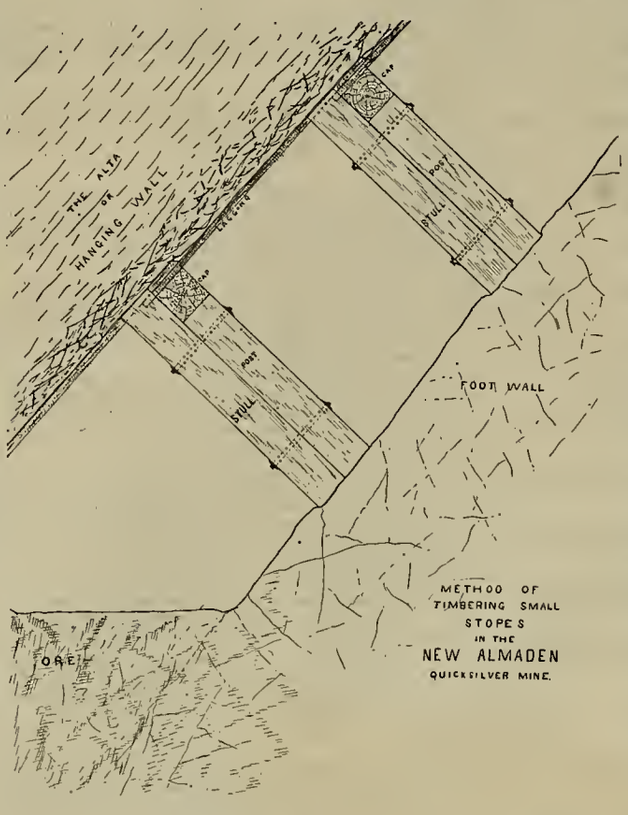


Fig. 15.E.

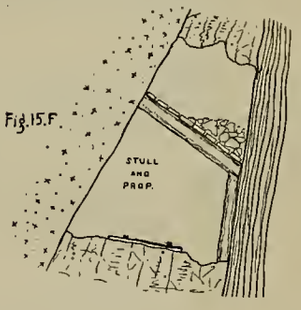
Inclined shafts are somewhat different from those that are vertical, and are probably quite as numerous. In California the number of inclined shafts far exceeds those that are vertical, being, as a rule, sunk on the vein which, in a majority of cases, dips at some angle from the horizontal. In a general way, what has been said of vertical shafts applies to those that are inclined. There is considerable difference, however, in the manner of framing timbers for an incline, and while timbers framed for an incline will do, perhaps, equally well in a vertical shaft, those framed as already shown in the illustration are not preferred in an incline.

The cuttings in mines which require the most care and greatest skill in placing timbers to support overhanging ground are "stopes" and large "chambers." The method adopted must always depend upon the size of the excavation, character of the ore and of the walls, the pitch of the vein or ore shoot, and also on the expense of the timber.



In some portions of the New Almaden mine, where the width of ore stoped is about ten feet, an unusual method of timbering has been adopted. The foot wall is usually hard and solid, while the "alta," as the hanging wall is called, is almost always soft and shelly, and is considered dangerous ground. Heavy stulls are placed at regular distances (about eight feet,) and are set in line one above another Immediately above the stull a second shorter timber is laid which rests upon the foot wall and reaches within about a foot of the hanging wall. A plate or cap is inserted over the upper end of this auxiliary stull which reaches horizontally across to the next stulls which are similarly placed. Heavy lagging is driven upward along the hanging wall, the lower ends of which rest upon the cap and the upper ends upon the lower ends of the lagging of the next set above. The two stulls are bolted together near the top and bottom for additional strength and security. Redwood has been used quite extensively in timbering this mine, and it is claimed that it has given satisfaction. The accompanying sketch will show this method of timbering. The large stopes of the New Almaden are timbered in square sets.

In veins which lie quite flat, the thickness of the vein and the system of mining must determine the character of timbering to a great extent, as well as the character of the walls. Where the vein is thin (a foot or two) very little timber is required, the waste rock filling the entire space behind the miner. Where the mineral deposit is thicker and timber is necessary various methods are pursued. Some ground stands well by simply leaving pillars of mineral. In other cases a series of upright posts and breasting caps will sustain the roof, the posts being placed in rows directly back of the workmen and as close to the face as the necessity demands. The foot of the post rests either directly on the rock floor or upon a block of wood or piece of heavy plank. The posts



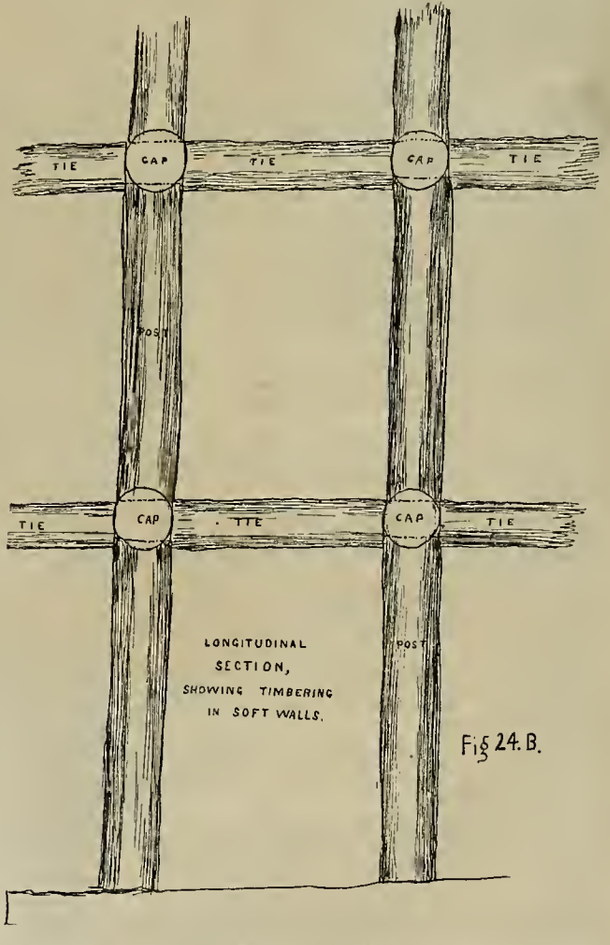
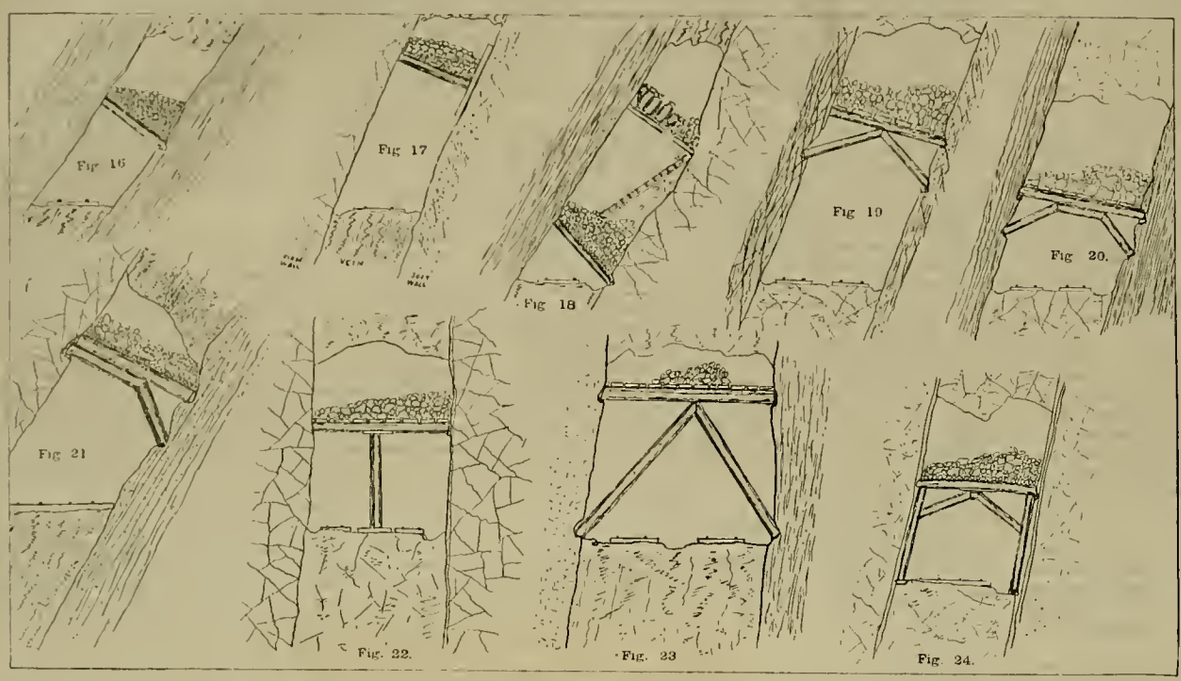


Fig. 24.B.

are forced into position by driving them up with heavy hammers. Care must be taken that these posts are so placed as to receive the weight of the roof directly and not at an angle. These timbers are set in lines standing in two, three or four rows back from the face, the waste being piled behind as the work advances. In this manner, by exercising care, many sticks can be recovered before the weight settles so heavily on the refuse rock as to render it impossible to remove the timbers. Some flat veins make little or no waste. It is then necessary to follow the "pillar and stall" system of extraction, considerable blocks being left to sustain the roof. Posts and caps are used in this system also. Frequently the caps reach in a continuous line from post to post, joining the next set, the ends of two caps resting on a single post, the combined sets being a hundred feet or more in width. Large timbers thus placed will support great weight, but if small rocks fall from the roof, lagging must be employed. This system is much in use in California gravel drift mines.



When a vein lying nearly or quite horizontal and making no waste is to be mined, a drift should be run along the lowest portion of the deposit, this point having been reached by incline or shaft. The work advances toward the surface, good sized pillars being left to sustain the roof. If timber is necessary, it is put in place in the manner required. The work having advanced sufficiently far toward the surface, the pillars may now be cut out at the back end, while the work progresses as before. As the pillars are removed more timber must be put in, or waste from the surface must be piled in cribs of timber built in the workings already made. Usually some timber can be recovered in this way and the caving of the roof after the complete removal of the ore or mineral does no harm. The main gangways should be substantially timbered, if necessary, as it is desirable to keep it open to the lowest working level at all times.

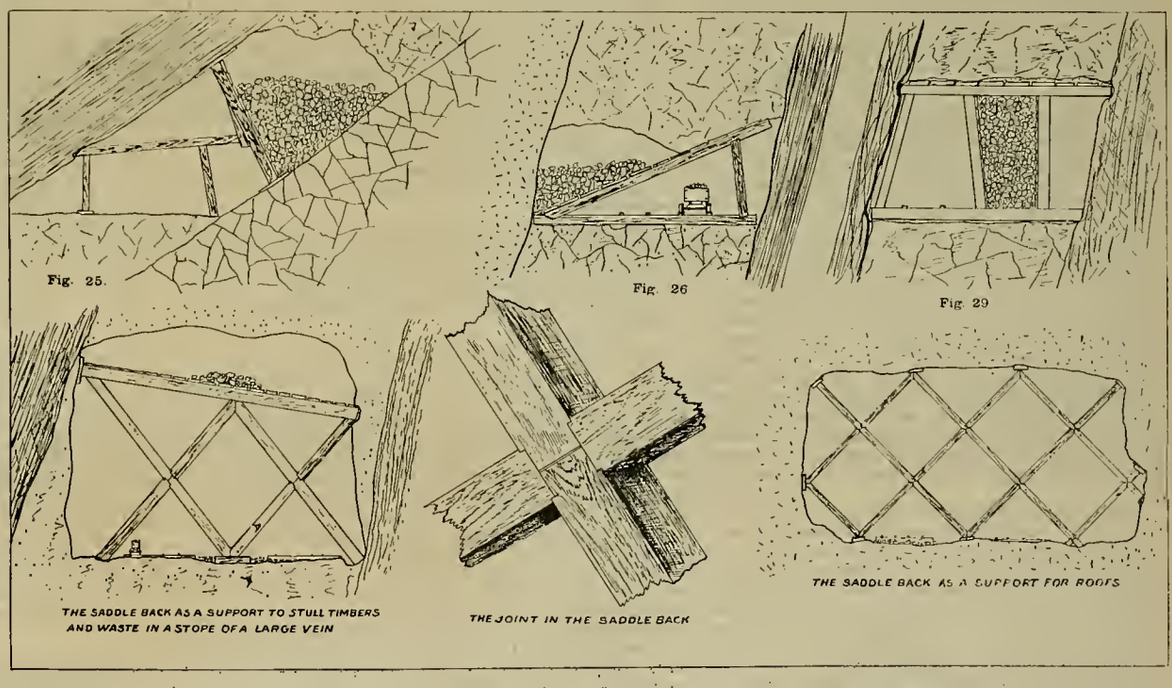


Fig. 25.
Fig. 26
Fig. 29
THE SADDLE BACK AS A SUPPORT TO STULL TIMBERS AND WASTE IN A STOPE OF A LARGE VEIN
THE JOINT IN THE SADDLE BACK
THE SADDLE BACK AS A SUPPORT FOR ROOFS

The "long wall" system of extracting ore is usually carried from the surface inward, a main gangway having been first driven ahead to a connection with a ventilation shaft, when possible. All the ore is removed at once, the waste being thrown back of the miners, who carry the breast forward with center considerably in advance of the sides, the excavation being in form somewhat like the letter "A," with the apex forward. The waste is thrown into the center to support the roof, while the side passages permit a free circulation of air all along the face.

In vertical or steeply inclined veins, the principles governing the methods of timbering are essentially the same as those above explained, though the application is different. In such workings the post of the flat vein becomes a "stull."

When a working drift is driven along a vein in ore and it is the intention to "stope" out the ore, the character of the walls and the width of the vein or deposit must determine the method of timbering. If the walls be hard and firm, and the vein not more than ten or twelve feet wide, posts are not absolutely necessary. Stulls of the proper length are placed with the lower end resting on the footwall, or in a niche cut for the purpose, the upper end being placed against the hanging wall and driven downward until it stands at a few degrees above a right angle with that wall. (See Figs. 16 and 18.) When the footwall has a greater inclination than the hanging wall, a support resting on the floor of the drift must be placed under the lower end of the stull. Should the footwall have a less inclination than the hanging wall, the foot of the stull may be secured by driving in stout wedges from the upper side. Where the footwall is sufficiently hard and firm, a niche in either case will answer as a secure rest for the lower end of the stull. Where the vein is more than ten feet in width and additional support appears necessary, resort may be had to the plans shown in Figs. 19 to 29.

In case either wall, or both of them, is too soft to safely sustain stulls under the pressure of ore or waste to be piled upon them, a plate (usually a two or three-inch plank) is inserted behind the stull on either wall or both, as may be necessary. (Figs. 17 and 25.)

When the walls are very soft, and even with the use of plates rendering timbering insecure, the stulls may be placed at right angles to the walls, the ends resting upon posts. Mining upward, the posts of each floor rest upon the stulls under foot and immediately above the posts on the floor below. In this manner a stope in soft walls may be carried to any desired height. (Fig. 24 A.) In such instances it is necessary to place longitudinal braces or "ties" reaching from cap to cap at right angles to the stull. These ties may be of smaller dimensions than the stull and post timbers.

The method shown in Fig. 19 may be employed where the vein exceeds eight or ten feet, and when sticks sufficiently large to support the weight of ore or waste cannot be obtained. Fig. 20 may be employed in the same manner with a greater width of vein. Both of these instances presume considerable waste to result from mining, which will, to a great extent, fill the excavation. Fig. 23 affords a firm support to a stull in a wide place in the vein, and Fig. 22 the same in a still broader vertical vein. Fig. 25 shows how, in a vein of low dip and considerable width, a stull may be firmly supported to retain waste or ore coming down from the stope above. In soft vein and wall rock a substantial method of placing sill, stull and post is shown in Fig. 26.

Stulls are placed at distances ranging from two and one-half to six feet, as may be required. On them are laid split lagging, forming a floor. As the miner stands on the floor thus improvised, he breaks down the ore, separating it from the waste, if there be any, and sending the ore into the "level" or main passageway below, allowing the waste to accumulate on the floor. The waste often occurs to such an extent that a portion of it also has to be sent to the surface. When this is the case, very little timber is required in the stopes. When, however, the quantity of waste is small, it is often necessary to build a temporary staging upon which to stand until a sufficient space is cut out above to admit of laying a second tier of stulls to sustain the floor. Floors are six to eight feet apart, and sometimes even more.

A passageway, called a "mill hole," "chute" or "slide," is left every thirty to fifty feet for the purpose of sending ore to the level below, as the work progresses upward. The distance between these slides is determined by the dip of the vein. They may be a greater distance apart in a steeply inclined vein than in one having a low angle of inclination. Rock will not run freely on a slope having a slope of less than forty degrees, and more is preferable. In cases where the slope angle is low, it is a good idea to line the slide with plank to facilitate the delivery of the ore to the level beneath. In opening a stope between levels, the best method is to make a raise from level to level, building a loading chute at the bottom. Then at a short distance to one side (fifteen or twenty feet) a second raise is carried up about fifteen feet and connected with the winze. From this point the stope is opened, the excavation being carried upward and the ore being passed down through the winze to the loading chute. As the floors are carried up a crib is built around the winze, keeping it constantly open. This plan secures economy of labor and affords the best obtainable ventilation. The stoping of ore continues to within a few

feet of the level above, aud is then discontinued for the time being, this mass of ore and that remaining within a few feet of the floor beneath being left to be taken out the last thing before abandoning this portion of the mine.

When ore is very rich it is the custom to blast or pick it down upon canvas or boards, keeping it separate as far as possible from the waste, the ore being sacked in the mine. The methods above described apply to overhand stoping, that is, excavating from a level upward.

(To be continued.)

Black Magnetic Sand.

Writing to the *Bulletin* regardiug the gold-bearing sand of the Pacific shore, E. W. Keeler says:

The great difficulty that for years has met every prospector for gold in these black sand deposits that constantly follow the line of tidal upheaval, is the fact that magnetic iron as fine as the grains of gold, and of nearly the same gravity, are found side by side, with a great preponderance of the iron. In some localities there is found in sand 25 to 40 per cent of pure magnetic iron that is capable of making a quality of metal equal to the finest imported Swedish. In all ordinary methods of separation this iron is so fine it is in the way, and interferes with any system of reaching and reclaiming an equally fiue particle of gold.

The coustant moving of the base for gathering these sands is objectionable on the score of successful or profitable working by ordinary methods.

It is supposed that from the extreme limit of the ebb tidal line on the beach, seaward, these sands have rested in greater quantity and depths for the reason that it is mostly after storms or high lashings of the sea that the profitable crests of sand are thrown up, showing that these particles drop and are imbedded near the outer line of disturbance.

In my washiug of sands from the vicinity of Gray's Harbor I found at least 30 per ceut was of fine magnetic ore. A fire assay of this ore showed a value of $26 of gold per ton. A deposit on the Atlantic Coast I worked was equally rich in magnetic iron, but carried no gold.

My method of separation was by electricity, while the sand was passing through my device in a wet state, which made a perfect separation, the magnetic iron not containing after separation three per cent of sand particles, and the effect is immediate, permitting the gold particles remaining to be recovered quickly and safely while the waste material is passing through. The iron has, and, it is thought by some, always will be, the difficulty in the way of securing gold, expeditiously and cheaply removed before attempting to secure the gold. Edison invented a process, by use of permanent magnets and first baking the sands, which did very well, but, being so expensive, is not available. My system removes quickly, just as the saud might be shoveled into the device from the beach, and can be constructed so three or four men can pull over the beach and manipulate all the sand they are able to gather; should the iron be desired for smelting, extra labor to bag and remove might be required. In one batch of sand I experimented with, the sand came from a depth of twenty-five feet, 100 yards away from the beach, and was equally rich in magnetic ore, and probably ages ago the line of the tidal flow was at that point. Ships are loaded with such maguetic iron ores at the mouth of the St. Lawrence river and taken to Europe, where processes for converting have been especially built.

I visited the only one in this country, which has been reconstructed in order to utilize these fine magnetic ores, and some 700 tons of the magnetic ore from the black sands, such as I experimented with, was being used. The muck bar iron was so superior that at that time it secured purchasers at $15 per ton over the ordinary. This furnace is surrounded by some twelve or more large hollow iron cylinders. A cone surmounted and rested on their edge. The ore was raised and dumped in the apex and filled each cylinder with this magnetic ore, which is as fine as granulated sugar. So connected, the ore was sprayed at intervals from the bottom over a furnace fire, with the usual flux used, one-third of the bed of fire being charcoal and a flame of jets from coal oil. This ore is so fine and pure that smelted in the ordinary way it would be quite consumed and irrecoverable for commercial use. With a permanent resting place for a machine and a constant supply of the sand the cost of separating the magnetic iron should not exceed—saying the sand carried even 20 per cent of the iron only—$1.50 to $2 per ton of iron. At the furnace above referred to it was calculated that 2.800 pounds of magnetic fine ore would make one ton of muck bar iron. The cost of this ore at that time at the seaport was about $10 per ton, with an expense of probably $2 more to reach the furnace in the interior. With the openiug of the Nicaragua Canal these ores will find a ready market on the Continent, and the sands carrying gold will always give in working an advantage over any produced in any other quarter of the world, and so give the Pacific States another inexhaustible mine of wealth.

River and Harbor Improvement.

The bill recently passed by Congress, and suffered to become a law without the President's approval, appropriates money in this district as follows:

Improving Sacramento and Feather rivers, California: Continuing improvements, including treatment of the Yuba river, near and above Marysville, and of the Bear river, one hundred and fifteen thousand dollars, of which ten thousand dollars, or so much thereof as may be necessary, shall be expended in snagging and other work between Tehama and Redding, on the Sacramento river; and, in the discretion of the Secretary of War, ten thousand dollars, or so much thereof as may be necessary, shall be expended in making a cut-off to avoid Shanghai bend on Feather river: Provided, That no money shall be expended in making said cut-off until the right of way therefor shall have been conveyed to the United States free of expense.

Improving San Joaquin river, California, including making cut-off at Twenty-one Mile Slough; and if, in the discretion of the Secretary of War, it is deemed beneficial to navigation by preventing deposit of sediment in Stockton channel or otherwise, the making of a double cut-off, beginning at Mormon Slough, immediately above its junction with Stockton channel, thence across the same, entering the San Joaquin river immediately below junction therewith of Stockton channel; continuing improvement fifty thousand dollars, of which ten thousand dollars, or so much thereof as may be necessary, shall be expended in snagging and other work in aid of navigation on the San Joaquin river, above the city of Stockton and in the Tuolumne river and other tributaries of the former: Provided, That no money shall be expended in making said double cut-off until the right of way therefor shall have been conveyed to the United States free of charge.

Improving Petaluma creek, California: Continuing improvements, fifteen thousand dollars.

Improving Mokelumne river, California: Continuing improvement, two thousand five hundred dollars, including snagging as far as county bridge at Thornton's, on said river: Provided, That no part of said sum shall be used until the drainage canal cut by private parties near New Hope landing shall have been closed.

Improving Napa river, California: Continuing improvement, four thousand dollars.

Under Section 10 of the act the Secretary of War is directed to cause preliminary examinations to be made at the following localities in this district:

San Joaquin river above the mouth of Stanislaus river, with a view to improvement, including closure of sloughs to a height sufficient to maintain current in main channel during low water period.

Feather river, above Marysville.

American river, with a view to prevention of sand flowing into the Sacramento river, near the city of Sacramento.

Steamboat channel, and from junction thereof with Sacramento river to mouth of said river, with a view to improvement, enlargement of navigable channel, and to increase capacity for flood discharge.

Suisun creek, with a view to improvement of channel.

Discussing the gold mines of the Republic of Colombia, and the failure of foreign companies, Don Vicente Restrepo says that often those failures are due to preventable causes: "In general, they enter upon their undertakings overburdened with fictitious capital divided among promoters, commission agents and stockbrokers; often they fail to take into consideration the special conditions of the country. They begin by sending out a multitude of officials and workmen, spendiug much money in salaries and the expenses of journey and maintenance. Once established in the district, these men frequently become exacting, take to drinking, and are a constant source of embarrassment. Moreover, the companies do not consider that our roads are narrow, broken up, and everywhere difficult to traverse, and that only light loads can pass over them; but they send out heavy machinery, whose massive pieces are doomed to lie rusting on the banks of our rivers. Such masses of iron, mute witnesses of disasters due to want of foresight, are frequently met with. Sometimes costly buildings are put up regardless of all expense. There is an instance of a foreign manager who arrived with a store of wines and preserved foods, and built himself a house full of conveniences in a desert region; when his foreign provisions came to an end he took his departure. We have known instances of engineers sent out here who could not handle a prismatic compass nor distinguish ores one from another, much less assay them. In this way millions of dollars have been squandered by foreigners on mining undertakings which, managed with judgment and economy, would have turned out well."

The Nevada Silver Convention platform declares for free silver, denies the right of the United States Government to pass laws restraining the privilege of any citizen to the free coinage of gold and silver into standard money at the legal ratio of 16 to 1, independent of any other nation, and demands the repeal of all laws denying such right.

Buying Gold Dust.

This has been an exceptionally active season among the placer miners, says the Spokane, Washington, *Spokesman-Review*, and as a result a great deal of gold dust finds its way to the banks and buyers of Spokane. William Nelson buys several hundred dollars' worth a day. "In a few days," he said yesterday, "the receipts will be much larger. The last three months of the year are always the best. In October I have bought as high as $5000 worth of dust in a day."

While the reporter was talking with Mr. Nelson, a man came in with a bag of gold. It weighed $142, and he took his check and went away happy. "This gold," explained Mr. Nelson, "comes from the Columbia river, and was mined by Chinese. You can tell by the color. It is yellower than the gold retorted by the white miners, who have not the knack of retorting that is possessed by the Chinese. Where does it come from? No one can tell. I only know that it is Columbia river gold. Ask the Chinamen who bring in the dust, and they give evasive answers."

The gold was in retort lumps from the size of a pea to one as big as a walnut. It has a porous appearance, and lacks the impressive weight of a natural solid nugget. Some retort gold brought in by white men during the day was quite dark and rusty, and had more the appearance of old iron than of the precious metal.

The successful buying of gold dust is an art iu itself. The Chinese, and often the whites, are up to tricks, and besides some of the retorted gold brought in carries a large percentage of quicksilver. Mr. Nelson, from long practice, has grown adept at passing on the value of gold. He breaks up the retort lumps, puts a file here and there on a nugget, and promptly sets the true value of the "dust."

Most of the gold brought here comes from the Pend d'Oreille and Trail creek placers, though a great deal comes from the Columbia and Snake rivers and from the Cœur d'Alenes. The Pend d'Oreille gold is in flakes aud small nuggets and the Columbia river dust is as fine as flour.

While the reporter was standing by the scales, Dr. Elmer came in with some fine dust in a vial which he had bought while on his visit to his Columbia river ranch. Some men are rocking the sand just across the river from his place, and one of them persuaded Dr. Elmer to take this little lot of dust in order to give him some ready money for a sack of flour. He estimated its value at $2, and the doctor, who is not expert at buying gold dust, thought there might be $1.50 worth, and paid that for it. It weighed exactly one pennyweight, and Dr. Elmer lost just 70 cents on his transactiou.

Every Wednesday a Spokane woman brings in from $30 to $32 worth of gold which her husband rocks out somewhere in the surrouuding country. She makes complaint that six ounces of gold sent her by her husband through the mails has never put in an appearance at the Spokane office.

Personal.

R. W. Miller, of Del Norte, has hought a giant and pipe enough to bring water 600 feet, and will work his mine on Smith river.

Congressman Caminetti, recently renominated on the State Democratic ticket in the Second Congressional district, declines the nomination.

L. W. Getchell, who has filled the position of superintendent for the Nowell Gold Mining Co., and the Berner's Bay Mining and Milling Co., Alaska, since April, 1893, has resigned his position and gone to bis home in Seattle.

J. E. McGrath and E. F. Dickinson are back from Alaska, where, as assistants of the U. S. Coast and Geodetic Survey, they have each been in charge of a party surveying the houndary hetween Alaska and British Columbia. The remainder of the expedition will sbortly arrive, the work being completed.

B. Petropavlosky, in charge of the construction of the Siberian railroad, is here from Siberia, via Yokohama, on his way to St. Petersburg to report on the progress of the undertaking on wbich he is engaged. On the way he will study the railroad systems of this country and Europe with a view of collecting information to be used in his own work.

Obituary.

Gen. Geo. Stoneman, ex-Governor of California, died at Buffalo, N. Y., on the 5th inst., aged 72.

The executive, advisory and finance committee of the State mining exhibit at the Midwinter Fair held a final meeting last Wednesday, closed up all their business and adjourned *sine die*. After paying all bills and satisfying all claims, there was a surplus of $1500, which was turned over to the California State Miners' Association.

The original intent was to hold the annual convention of the California State Miners' Association on October 10th, but it is thought the meeting may be deferred till after the November election. At a meeting of the executive committee to be held uext Monday, the exact date of the convention of '94 will be decided upon.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XII

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

1884.—There were at least twenty producing gas wells near Pittsburg. Before the introduction of gas 3,000,000 tons of coal per annum were used in Pittsburg. A single gas well produced the equivalent of 1200 tons of coal per day.

Up to this date meters were not used in Pittsburg and the loss from carelessness or unskillful use was very great. When they were introduced, the price of gas was fifteen cents per thousand feet. Pipe lines were laid from the gas wells at Murraysville and Tarentum to Pittsburg.

The value of natural gas used in the United States during this year was $1,460,000.

1885.—The gas mania reached its height. Pipe lines similar to those used to conduct petroleum were laid from the producing gas wells to the manufacturing centers at a distance.

The value of the coal replaced this year was $4,857,200.

1886.—There were 300 miles of pipe from 6 to 24 inches in diameter conveying natural gas to consumers. The value of gas used was $10,012,000.

1887.—The consumption of gas was valued at $15,838,500.

1888.—About this date symptoms of a decline in the production of gas began to appear. Consumers were required to pay 22½ cents per thousand—all paid for by meter. No large manufactories were supplied even at that price, and there were other indications of a failing supply; yet the value of the gas consumed in that year was estimated at $22,629,875.

1889.—The most productive gas well ever known was struck near Bellevernon, 26 miles from Pittsburg. The daily yield was 40,000,000 cubic feet, under a pressure of 800 pounds to the square inch.

1890.—A gas well was sunk at Newton Center, Lackawana county, Pennsylvania, which promised to prove of great importance.

1893.—Notwithstanding the repeated statements that the supply of natural gas was decreasing, the following was telegraphed to San Francisco and published in the city papers:

FINDLAY (O.), September 12.—All previous records in gas wells have been broken. This morning D. T. Davis completed a well on the Ross Farm in Cass township, which is good for 50,000,000 cubic feet per day, making it the largest well ever struck in the world. The well is but 60 feet from the city's 19,000,000 "gusher," struck two months ago, and the greatest excitement prevails. Scarcely had the "go devil" struck, than the well responded with a hiss and a roar such as has never before been heard.

The rush of the gas from the tapped reservoir was awful, and the gauge placed over the well showed it to be beyond measuring. The indicator shot up to the 25,000,000 mark and then stopped, for it could go no farther. The well has a larger capacity than this. It has been estimated at from 25,000,000 to 50,000,000 cubic feet.

Natural gas at the surface of the earth is not sufficiently abundant to play an important part in human economy, but obtained by artificial means from a considerable depth, it has become an important factor in many industries and has added very materially to the wealth, comfort and conveuience of mankind. Its use has been principally confined to the United States, its consumption in China and elsewhere being comparatively unimportant.

When, as has been shown, one locality after another with bewildering rapidity began to yield vastly more gas than could be utilized, the ingenuity of man was taxed to its utmost to overcome difficulties arising from ignorance and want of experience; before this was accomplished much of the precious fuel was forever lost. When it first began to be known it was considered more a curiosity, a strange natural phenomenon, than a matter of economy and use. At first it was so cheap in the United States that street lamps were allowed to burn day and night, but after a time more care was taken of the supply. Explosions were common from the escape of gas in cellars, but accidents are now rare owing to better management.

In Pittsburg at one time natural gas replaced 10,000 tons of coal daily, and changed that city from one proverbially sooty, to one of the cleanest in the United States. Bradford, an oil and gas center in McKean county, Pennsylvania, is now populous and prosperous. The wells are sunk to a depth of from 2000 to 3000 feet, to what are technically called the third sands. At first the gas was allowed to go to waste for two reasons, one that its value was unknown, and the other because it was found impossible to control it; the great pressure could not at first be overcome.

The waste of gas has been enormous, when we consider that some wells produce 30,000,000 cubic feet per day. Fears being entertained that the escaping gas might engender disease, it was thought best to ignite it and keep it burning. To accomplish this a firebrand was thrown toward it. It was sometimes more conveniently ignited by a burning paper at the end of a long fishing rod, or by shooting fire balls from a Roman candle. When it was found that the gas was valuable, every effort was made to control it, and to check the waste. When a cap with an open valve was screwed on the top of the well pipe, and an attempt made to close it, sometimes the casing was blown out of the ground. The pipes in gas wells specially drilled for that purpose are now two inches in diameter, inside measure, of welded wrought iron, screwed together by sockets like ordinary steam or gas pipes.

When the use of natural gas had reached its maximum, it was enormously consumed in manufactures. In Pittsburg it was used for all purposes formerly supplied by coal except smelting of ores in blast furnaces, in which it failed. It was specially used in iron work and in the manufacture of glass and pottery. The Crescent Steel Works of Pittsburg is reported to have used 30,000 cubic feet of gas per hour in mechanical puddlers producing blooms equal to 2240 pounds every twenty minutes. Iron made with gas is purer than when coal fuel is employed, owing to the absence of sulphur, carbon and phosphorus. The principal consumption is in the manufacture of glass. One hundred and fifty-five pots are employed in making window glass. The growth of Findley, Ohio, was stimulated by giving gas to manufacturers practically free for a time. The Karg well—the principal one—yielded 2,000,000 cubic feet daily. In the Eastern States, natural gas was, and still is, extensively used in dwelling houses. A grate filled with broken brick receives the gas, which soon raising the fragments to a red heat, produces a fire resembling, and equal to, one made of the best anthracite coal, which requires but little or no attention or care. Some consumers fill the grate with other substances, such as furnace slag and even cast-off porcelain door knobs.

Large manufactories are supplied by meter. In Ohio, in 1890, an inch pipe was brought to a dwelling, conveying gas sufficient for all domestic purposes, both for lighting and heating, at a cost of $40 per annum. There was no limit to the amount that might be used, except the size of the supply or service pipe. In Pennsylvania the charge for supplying cooking stoves was from $3 to $4 per month. Gas is supplied to grates and heating stoves for from $2 to $3 monthly, and to grates and ranges by an inch pipe; the flow is regulated by a globe valve. Imitation wood of pottery ware or iron is sometimes laid in parlor grates and pierced with holes from which the issuing gas jets burn. In 1888, at and near Pittsburg, an ordinary dwelling house was supplied with gas for $60 by the year; the most elaborate at a cost not exceeding $125. This is about one-half the cost of coal. For convenience the gas is far superior.

To control natural gas at first seemed to defy the ingenuity of man. All not consumed was of necessity allowed to escape. The regulator system, by which the flow was modified, consisted of pipes and valves, a portion or all of which could be opened or closed at will, and by careful attention or management a considerable portion could be saved. An attempt was first made to anchor the pipes or hold them down by bracing them from trees, to prevent them from being blown bodily out of the ground. These rude appliances were followed by iron platforms or flanges riveted to the pipes, on which stones were piled or masonry built. It was found that by making everything strong and the pipes small, the gas could be entirely shut off when required; and by experience it was learned to sink a number of wells near each other, and when the gas was flowing from all with diminished pressure they attached globe valve cut-offs to the pipes, one by one, after which they closed them gradually, in succession, and stopped the flow at will. This was a great triumph. It is a cause of regret that such great quantities of the best of all fuels should have gone to waste before this could be accomplished. Gas was led in branch pipes to street lamps and to places where it could be utilized, long before it could be shut off and retained in the pipes until required.

Pipe lines were laid to cities and manufacturing centers. They were from twenty to fifty miles and upward in length. The average line pipes are from five to eight inches in diameter. They are generally buried four feet underground, to prevent freezing and accidents. Several or many gas wells discharge into these conduits. One pipe line near Titusville has 100 wells "blowing" into it. No gasometers are used, for the volume of gas produced by the wells and consumed is so great that it would be impossible to store it. The conduit and delivery pipes vary from three to thirty inches in diameter. The sizes most used are from six to eight inches. George Westinghouse Jr. invented a system of pipes to collect and convey leakage gas from the main pipe lines. They were parallel to the conduit pipes, and the gas was burned from convenient lamp posts or allowed to escape into the air from elevated exits.

(To be Continued.)

Interests of the Silver Miners.

A correspondent of a Georgia exchange writes: "Do you think it is fair to give the silver mine owners increased prices for their silver by means of free coinage?"

A brief question, squarely put. We shall try to answer it briefly and squarely. It would not be fair to increase the value of silver in the interests of the mine owners alone—indeed it would be rank injustice. But the mine owners' interests in the matter are infinitesimal when compared to those of the people at large.

So far as the exchange value of their silver is concerned, the mine owners have lost nothing whatever by the demonetization of the white metal. An ounce of silver would buy a bushel of wheat in 1873; it will buy a bushel of wheat now—perhaps a little more; it would buy sixteen yards of calico in 1874; it will buy sixteen yards of calico now—and so on through the list. The demonetization of silver has affected the mine owners precisely as it has affected other producers—no more, no less. They have to give for a gold dollar twice as much of the product of their capital and labor—which is silver bullion—as they gave in 1873; but the gold dollar will not pay a cent's worth more debt now than it did twenty years ago. That is the whole story in a nutshell.

In South Africa.

Chas. Hunt, a former Comstocker, is back from Johannesburg, South Africa, and to the *Examiner* says that the lay of the land, the color of the soil and sky, and the temperature reminded him of the San Joaquin valley, with the exception that there are no mountains in view. There is a curious outcropping of pebbly quartz for forty miles along the dead level country. This is the famous cropping known as the "reef" in that country, and which we would call a ledge. It is on this that the great gold mines have been discovered. The ledge tips downward at an angle of about thirty-five degrees. In one place the ledge has been reached by a shaft 900 feet deep from the surface. The other shafts and workings are of various depths.

For the ordinary man I do not think the country about Johannesburg promises any better than this country, but experienced mining men and certain mechanics can do very well. Managers of mines get on the average $500 a month, foremen $250 and shift bosses $5 a day. Bricklayers, carpenters, masons and mechanics get about $7 a day, and clerks about $3.50 or $3.75. There is a demand for skilled mechanics. As for the actual mining work, that is all done by Kafirs, who work much cheaper than the average intelligent miner can.

Living expenses are considerably higher there than here, so that a man who goes there must keep busy or his expenses will eat up what he makes.

There is a demand for American timber for the mines. The timbers they get are small, usually only three or four inches through, and are worth twenty-five cents a foot of length measure. They have to be put in a mine pretty thick to sustain the weight. The Oregon and Puget Sound timber is just what is wanted there. It can be taken to that country and sold for $25 a thousand feet at a profit, and it now brings as high as $60.

There is a great deal of interest in Matabeleland. The new town of Bulawayo, 400 miles from Johannesburg, in Matebelaland, is only a few months old and now numbers 3000 men, with more going in all the time. Most of the men there are Americans. They have good "reef" there already and they call it the Pacific.

It takes a man about a month to find out whether he likes the country or not, and usually at the end of that time he does. Most of the people are English and Dutch. Their ways and, to some extent, their dress are different from ours and it takes a little while to get accustomed to the change. Even Johannesburg, the center of the gold fields, is a very moral place. All the various denominations of churches are represented, and not a saloon in the place is open on Sunday. The Johannesburg authorities are very strict about that.

Complimentary Notices.

A whole page could be filled with complimentary notices of this paper. A few are appended. We are glad to elicit such mention and hope by care and effort to merit their continuance:

Leading Mining Journal.

The MINING AND SCIENTIFIC PRESS of San Francisco has entered upon Volume LIX and appears in an entirely new dress. The PRESS is the leading mining journal on the coast and should be well patronized. It is as handsome a paper as any printed in the State.—Nevada City Transcript.

Most Valuable.

That most valuable exchange, the MINING AND SCIENTIFIC PRESS, appears in an entirely new dress. We are pleased to see this evidence of prosperity in the PRESS. It is the leading mining journal of the coast, and its prosperity is well merited.—Oroville Mercury.

A High Standing.

The MINING AND SCIENTIFIC PRESS has entered upon a new volume and celebrated the occasion with a clear and attractive new dress. This paper has attained a standing among mining men of the Pacific coast that only a true and honest devotion to mines and mining matters could bring about. Its mining reports and illustrations of mining appliances are striking features of this publication, and it circulates information of importance to large mine-owners as well as the lonely seeker for the hidden treasure. Long may the MINING AND SCIENTIFIC PRESS continue to prosper is the wish of the *Record!*—Amador Record.

A Valuable Publication.

The MINING AND SCIENTIFIC PRESS of San Francisco, one of the most valuable publications on the coast, has lately assumed a new dress. Its last issue contained a summary of the progress and position of the mining industry of the State. We constantly regret that our preoccupation with other subjects prevents our devoting the study that we should like to do to the contents of this paper.—Los Angeles Commercial Bulletin.

Scientific Progress.

Electrolysis of Buried Pipes.

In order to ascertain exactly what takes place when gas and water pipes are destroyed by return currents from trolley systems, Professor D. C. Jackson of the University of Wisconsin has been conducting unique experiments. He took a number of cells and filled each of them with a weak solution of some salt usually found in the soil of city streets. He then sent currents from a battery through the various liquids, using iron electrodes, or terminals, on the immersed wires. He experimented chiefly with nitrates and chlorides of ammonia, potash and soda, but also with other salts. He found that corrosion of the anode—that is, the terminal by which the current left to enter the fluid—always ensues. The cathode, or negative terminal, was unaffected. There was usually a deposit of the disintegrated or oxidized iron, not close beside the damaged electrode, but about half way between the two.

His interpretation of the facts is this: The soluble salt is first analyzed, and the acid in it then attacks the anode, while the alkaline base unites with water to form a hydroxide at the cathode, liberating hydrogen there. The iron salt produced at the anode is dissolved, and diffuses itself, and so does the hydroxide. Where they meet they unite and form a ferrous hydroxide, which is precipitated. He finds the activity of the chlorides, nitrates and sulphates to be in the order in which they are here named. Carbonates are without noticeable effect. Although the composition of street soils is more complex than the electrolytes of these experiments, the former contain the same salts, and must lend themselves to the same change.

The widely observed and oft-reported destruction of gas and water pipes has invariably occurred, so far as could be discovered, at the points where the mischievous current was leaving the unauthorized metal route, which it had adopted in preference to the prescribed one; and from this it has been inferred that operation was electrolytic, but it has never before been the subject of such careful investigation as in the present instance. Professor Jackson shows the correctness of that supposition, sheds light upon the method of the transaction and also proves that a minute quantity of the salt and a very low voltage are sufficient to set up chemical action, which, once begun, continues as long as any current is flowing.

Sympathetic Vibration.

The well-known phrase of Dr. Chalmers, "The power of littles," is strikingly illustrated in the physical world by the phenomena we are about to study. Little forces acting in the same direction and recurring at rapid and regular intervals of time will, if accumulated, soon add up to a single force of gigantic magnitude. Every one has heard how a regiment of soldiers, when crossing a suspension bridge, have to break step, lest the uniform tramp of their feet should set up as it might well do, a dangerously large oscillation of the bridge. A half-hundredweight hung up by a wire may be thrown into a considerable swing by a succession of gentle taps, or even puffs of air, if the taps or puffs hit the suspended body at the right moment, that is, when the feeble impulses conspire in the same direction with that of the swinging weight. To give definiteness, imagine the wire supporting the half hundredweight to be rather more than a yard long, the time taken for the weight to make a single swing in one direction will then be a second; the arrangement will be in fact a second's pendulum.

Let us now attach one end of a fine thread to the weight and every second give the feeblest possible jerk to the threads. We shall soon find that a surprisingly large swing of the pendulum is to set up, because the gentle impetus we have given synchronises with the period of the swinging weight.

The trivial amount of enegy in each pull is stored up in the weight, so that if we now attempted to stop the oscillations of the weight by a single pull of the thread we could not do so, as the thread would break. In fact, if the half hundredweight be swinging through an arc which measures a foot across, it will be moving with an average velocity of a foot per second, thus possessing a momentum equal to a half-ounce bullet moving with a velocity of nearly 1800 feet a second—more than sufficient to kill a man. All this energy has been transmitted through a thread an infant could break, and has accumulated in the weight owing to the succession of tiny jerks coinciding with the peroid of the pendulum.

A common swing illustrates the same law, for a swing is nothing more than a long pendulum. At the right moment the child in swinging gives a push with its foot or an impulse in the right direction, by bending its body forward so as to throw the center of gravity in front of the seat of the swing, and the addition of these small forces soon creates a wide excursion of the swing to and fro. In like manner, a heavy lever watch hung from a hook will, after the lapse of a little time, often be found vibrating in accord with the movement of its balance wheel.

DR. JOULE'S STUDIES in mechanical equivalents of heat brought forth the compound engine. In 1850 it required 14,500 pounds of coal to transport a ton of grain to Europe. Now 350 pounds will carry a ton. An inch cube of coal will carry a ton of cargo two miles. In 1880 the cost of carrying a bushel of grain from New York to Liverpool was 18 cents; in 1886 it cost two cents.

A SPECIAL MOUTHPIECE for public telephones is being introduced in Germany with the object of avoiding the spread of diseases carried by condensed moisture of the breath. A pad or a large number of disks of paper, with a hole in the middle, is inserted in the mouthpiece, and the upper disk of the paper is torn off after every conversation.

ELECTRIC MELTING of metals, notably cast iron and steel, as produced by a new Germau process, is said to have some very great advantages. In crucible steel the new process shows an economy of fuel of more than half, which, for metal so difficult of fusion, is a favorable result.

HORSESHOES made of papier mache have been introduced into Germany, and are said to give satisfaction. It is predicted that in a few years they will take the place of iron shoes wherever horses are shod.

Decline in Use of Brimstone.

During the last two years there have been exported from England considerable quantities of recovered sulphur, amounting, in 1893, to 12,700 tons, which has displaced just as much of the Sicilian product. This has been principally used by manufacturers of wood pulp, for which it is peculiarly adapted by reason of greater purity. It is probable that the use of recovered sulphur will increase and that, therefore, the demand for crude brimstone will be further affected.

It is estimated that the consumption of pyrites in the United States last year aggregated over 200,000 tons, which is equivalent to over 100,000 tons of brimstone. Thus it will be seen that 112,000 tons of brimstone were replaced last year, which, had this amount been drawn from Sicily, would have reduced the stock on hand to 37,000 tons, a very small amount. With the ever increasing use of pyrites and of recovered sulphur the outlook for the brimstone miners in Sicily is not encouraging.

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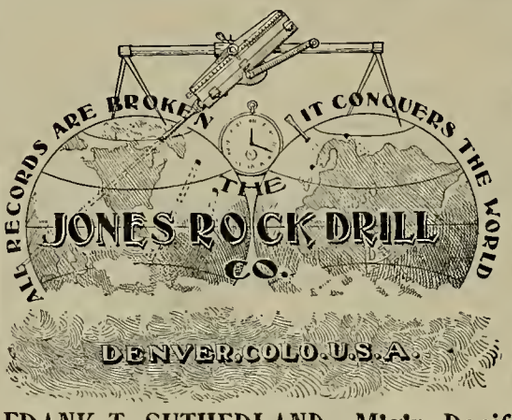

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Mechanical Progress.

Flight by Steam Puwer.

Engineering, of London, publishes an account of the actual flight of a flying machine, constructed by Hiram Maxim, and driven by steam. The machine weighs, complete, 7700 pounds. There are two screws 17 feet 6 inches diameter revolving 400 turns a minute and giving a total thrust of 2000 pounds. Each of these screws is driven by a compound engine. The boiler weighs 1000 pounds, carries 200 pounds of water, and develops steam for 300-horse power. The fuel is gasoline, which vaporized and burned in several thousand jets. There is an aeroplane with 1400 square feet surface, besides which there are other wings that assist in sustaining the weight, but, like the aeroplane itself, have no independent motion. The machine is an experimental one made to run upon a track, and with another track above designed to hold the machine down or prevent it from rising freely. During a trial which occurred July 31st this upper track failed by the bending of an arm carrying a wheel and the machine rose but quickly came to grief through not being designedly and properly launched. Three men, including Mr. Maxim, were upon it at the time, and the result showed that a machine carrying its own fuel, boiler and engines can fly by sheer exertion of energy.

Electrical Muscle Making.

Some recent scientific researches, which the *Electrical World* says can doubtless he trusted, show that the weight of muscles of animals was increased forty per cent hy the proper periodic application of an electric current, the growth being a true development of the muscle. According to this it will now he possible to increase to order size of any desired muscle without tiresome gymnastic exercises, by simply lying in a soft chair and having the current applied. This, we suggest, might be done at night by an automatic apparatus, thus saviug time. Persous who are improperly developed may now be balanced or "trued up;" muscles shrunken by age may now he made plump again. Calves, which nature or exercise has failed to develop sufficiently, will now no longer be a drawback to wearing knee breeches, or the short bloomers of the female hicyclist. The question naturally suggests itself, What will happen if this process of developing muscles electrically is continued still longer? If some way is then found to develop the hones, the manufacture of giants by electrical means will be an easy matter.

IT IS AFFIRMED hy a Continental contemporary, which ought to be a reliable authority on such a subject, that we shall soon have the surprising novelty of aluminum stockings put ou the market. It is said that hy some special procedure, which of course is kept secret, aluminum is mixed with the yarn without any injury to the flexibility of the material or any interference with the customary method of working it up. In the first instance only the heels and the toes will be dealt with, as they need to he doubly strong.

W. A. EDDY'S experiments with tailless kites at Bayonne, N. J., last year enahled him to reach an altitude of 5460 feet; hut attempts are now being made at the Blue Hill Observatory, near Boston, with similar kites, with which it is hoped to attain an elevation of 10,000 feet. Mr. Eddy used nine kites, flown taudem, the series combining to sustain a greater weight of cord than one kite could lift.

A GREAT DEAL of ornamental hardware for huilding purposes has been stamped or embossed with a die, the articles being made out of sheet metal. Bronze has hitherto heen used almost exclusively, hut now steel is being treated in the same way. This is cheaper than casting, and allows greater freedom of design, although the scheme has its limitations.

A LAMP WICK of clay, which is indestructible and which gives twenty-five per cent more light than cotton, is said to be a recent triumph of inventive genius. In addition to the natural scarcity of the material, capillary qualities are given to the wick by incorporating vegetable fiber with the clay while soft and then burning the filaments out in the baking.

Ancient Gold Miners.

The Incas of South America are among the most ancient of gold miners. The amount of gold and silver produced by them is amazing. Atahulapa, the last of their chiefs, bribed Pizara for release from prison by offering to fill with gold, as high as he could reach, a room 22x17 feet. These Indians were very successful mining engiueers. Many of the canals and sluices constructed by them for use in hydraulic mining still exist in Peru and show surprising ingenuity. Many of their copper mining tools have also been discovered. For washing the metalliferous dirt they employed a so-called "batea," or wooden pan, differing from the miner's "pan" of Arizona only in having a conical bottom, at the apex of which the gold was collected by dexterous handling. These Indians were also acquainted with the process of collecting gold by quicksilver riffles.

The Amazon Indians used a dugout canoe, its bottom fluted with transverse grooves. This they tipped on end, turned ou some water, and theu rocked it to and fro, gathering the gold in the grooves and at the bow of the hoat. These antique tools and mining works were displayed in the South American sections or in the archæological division of the main miuing display at the World's Fair. The rich mines of gold and silver in the mountains of Mexico have been worked since prehistoric times by the aucieut Montezumas. Their process of treating the ores survive to the present day. The ore is packed to the reducing establishment, called haciendas, is assorted and then pulverized in the arrastra. This consists of a large round vat, like a mortar, with a grinding arraugement consisting of three granite stones of an obloug shape. These are tied to a pole, conneeted with au axle, and turned by a mule walking around in a circle hlindfolded.

The somewhat famous "patio process" was inveuted by Barthlome de Medina, a Mexican miner, ahout 1551. Within two centuries it was generally used throughout Mexico and theu adopted in Europe, only to be replaced by more modern methods. The process derives its names from the patio, or yards, at the mouth of the mine where the operatiou is usually conducted. The pasty mud taken from the arrastra mills is thrown upon a hard stone floor, and after heing filled with quicksilver and salt, is called soup. After undergoing evaporation for several days, the mass is stirred up by the feet of horses aud men until it is well mixed, when it is called cake or mud. The amalgamated silver is washed and then placed in canvas bags.

The mercury is squeezed out by pressure and the residual silver is purified in a furnace and then run off into molds. Mexico still furnishes some of the old-fashioned Catalan forces for iron making with their crude hammers and water blasts. Catalonia was a province in Spain where this antique implement was first employed, and from which skilled ironmongers were exported to the uew world. In New Mexico and Arizona the Aztec mines, worked hy peons hundreds of years ago, are still to be found, and in the State of Sonora Senator Tahor of Denver lately purchased aud reopened one of these known from early history as the Santa Maria or Holy Mary. These mines extend northward to the Colorado line and some of them are very rich.

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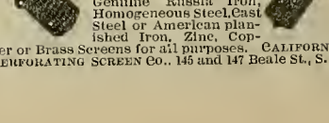
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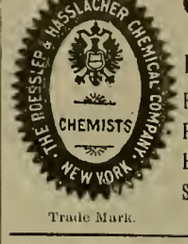

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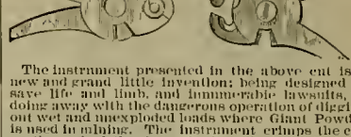
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CONSIDERABLE STIR.—*Record:* There is considerable stir in mining affairs in and around Plymouth at present and the people there are looking forward to the dawn of better times very shortly. The rumor is current that the Ivanhoe mine has been sold to San Francisco parties. Several men are at work in the Little Giant mine and the prospects of this property are said to be encouraging. Sinking in the Pioneer is going on both day and night and the owners feel well satisfied with the process that is being made. At the New London work is being pushed ahead at a rapid rate and the future of this mine will surely bring good results to the shareholders. It is said that an English company is negotiating for the purchase of the Alpine mine.

MINING NOTES.—*Ledger:* Knight & Co. have the contract for the Argonaut hoist. It is to be completed in seventy-five days.

The Alma mine, which recently suspended operations, is running again. The work of shaft sinking is being pushed as rapidly as it can be with three shifts daily.

Calaveras.

MINING AT WEST POINT.—Angels *Herald:* A large load of machinery has been brought up for the Mattie mine.

At the Wide West a large air-blower has been placed in position. About twelve tons of high-grade ore are now on the dump. A trial of the ore is now being made at the Lockwood furnace.

Superintendent Oliver of the Blazing Star is expected daily from San Francisco. Twelve men are at work in the bottom of the mine taking out ore and doing improvement work. The best of the rock is being shipped below to be treated, while the free-milling ore will be milled at the mine. Large tanks are now being erected to supply the mill with water. The mill will be ready to start in a few days.

A very rich strike was made in the Lone Star mine last week. It is said that a four-teen-foot vein was uncovered.

THE BURNEY MINE.—The Burney mine will be in operation inside of six weeks. A mill of ten stamps capacity is now being built. The shaft is down 135 feet and the ledge is fifteen feet wide. The Burney is located one mile northeast of town.

PUSHING AHEAD.—At the Calaveras Con. mine, located at Robinson's Ferry, work was suspended on the 400 level Tuesday owing to a falling off in the water supply. It is decided to concentrate the entire work of the mine for the present on the 500 level, in which quarter the prospects are quite encouraging. It is believed that by the time the water supply regains its normal flow this level will be sufficiently developed to keep the mill running steadily on good paying ore.

El Dorado.

THE GRAND VICTORY.—*Republican:* At the Grand Victory mine they have had twenty stamps of the mill running for some time on ore from the mine, putting through the loose surface at first, and more recently working the solid formation of the ore body underneath. The gold has been saved successfully by amalgamation on plates and even with this small plant the operators claim that it is paying. They are proving their faith in the mine by making preparations to remodel and reconstruct the mill. All the old timbers and other work are being torn out of the lower half of the mill preparatory to running the entire forty stamps the mill now contains. Eight concentrators will be put in as soon as additional stamps are ready for operation and the owners expect to eventually increase the capacity of the mill to one hundred stamps if their present favorable prospects continue. The concentrates will be reduced by the cyanide process, extensive preparations for which have already been made.

Nevada.

ENGLISH MOUNTAIN.—*Telegraph:* The people who are operating the English Mountain mine are now putting "things into shape" up there. The mine is located about six miles above Bowman's Dam. The ledge is four feet wide and the mill test of the ore is something wonderful, if reports he true. Some crushings went as high as $80 per ton. The company, organized hy Jas. Holsworth, are mostly Chicago people, and they are now hauling in 1000 tons of machinery aud a large amount of lumber, all coming hy way of Emigrant Gap, as that is the nearest point of approach. The company is building a 20-stamp mill, and the tramway from the tunnel to the mill will be half a mile in length. There are now 75 men on the payroll, and in a short while a great many more will he added. The company have a property in the English Mountain claim which they may he proud of.

EIGHTY-FIVE DOLLAR ORE.—Joseph Floyd & Co., who have for a short time past heen working the Cal. R. Clarke mine near the old Half Mile House, have about thirty tons of ore on the dump. The Pioneer Reduction Company has offered them $60 a ton for it at the mine, hut they refused to sell, as they are confident it will yield at least $85 a ton. Of course they can haul and work it for considerahly less than $25 a ton. The ledge is not large, hut is clearly defined. The present working is at a depth of about 100 feet on the incline, and there is much water to contend with.

Placer.

IOWA HILL—*Sentinel:* The Morniug Star and Harmon mines are working about 50 and 40 men respectively and are both doing well.

The work on the tunnel in the Juno claim is heing pushed forward as rapidly as the hard rock in the tunnel will permit.

Two other tunnels are heing run in claims south of the Morning Star mines. One of these has struck good prospects and the other has good indications of striking gravel in a very short time.

NEVADA.

Washoe District.

The following is from the weekly official letters of the superintendents:

CON. CALIFORNIA AND VIRGINIA:—In continning the work stoping in the ore body to the west and south and upward to the 9th floor—one floor above the sill floor of this level—we have extracted during the week 350 carloads of ore—ahout 317 tons—the average assay value of which, per mine car samples, was $63 25 per ton. The stopes look well.

On the 1700 level—22 feet below the south drift No. 3—the south drift has heen extended 10 feet, in ore which will average $70 per ton; total length of drift 66 feet; face in porphyry and quartz assaying $30 per ton.

1000 level—The north drift from the crosscut run west from the bottom of the winze—down 28 feet—which was sunk on the east side of main drift 280 feet south from the shaft s tation, has heen advanced 15 feet; total length 50 feet; continuing in a porphyry and quartz formation of a low assay value.

The west crosscut started from the main drift, 345 feet south from the shaft station has heen advanced 20 feet; total length 230 feet; continuing in porphyry and quartz.

All work on this level and all work carried on hy the Con. Virginia Company through the Con. Virginia shaft has heen suspended.

Have shipped to the Morgan mill during the week 103 tons and 130 pounds of ore, the average assay value of which (per railroad car sample) was $43.16 per ton. The average assay value (per hattery sample) of all the ore worked at that mill during the week (362 tons, 810 pounds) was $55.86 per ton.

Bullion shipped to the Carson Mint—assay value—$86,029.46.

OPHIR.—1465 level—The upraise started at a point 70 feet in from the mouth of the east crosscut started from a point in the main north drift 124 feet north from the main east crosscut from the Ophir shaft, has heen carried up 12 feet; total height, 45 feet; face in porphyry, clay and quartz of low value.

Have continued jointly with the Mexican Company the work of makiug repairs in the main shaft, at the 1100 level.

Central Tunnel—The old winze, which was reached at a point 220 feet in from the mouth of the crosscut run west from the north drift from Mexican shaft on the tuunel level has been reopened down 6 feet; total length 24 feet.

The drift running north from the end of the west crosscut, 56 feet above the tunnel level, which had heen advanced 90 feet in that direction, has been extended 5 feet; total length in a north course, 95 feet.

WEST CON. VIRGINIA & CALIFORNIA—During the past week we have been engaged in repairs at the station and the north drift. The west crosscut run from a poiut 320 feet north of the 1100 level station, has been extended 16 feet, and the material run through is a favorable nature, and is composed of quartz, lime and feldspar some of which assayed in gold per ton, $276 and in silver $2.50. The crosscut is now in a total distance of 1146 feet. The face is in the same material as that above described.

MEXICAN—1465 level—The west crosscut started from the top of the upraise which was carried up 45 feet above the sill floor of this level at a point 40 feet west from the main north drift and 100 feet north from the south line of the mine, has been extended during the week 23 feet; total length, 351 feet. Face in porphyry, showing fine lines of quartz.

As joint work with the Ophir Company, are making repairs in the Ophir shaft on the 1100 level.

BEST & BELCHER—750 level—East crosscut No. 1, started from upraise No. 1 from 800 level, has been extended 19 feet through hard quartz and porphyry; total length, 61 feet.

200 level—The west crosscut No. 1, started from the incline upraise, 50 feet from 200 level, has heen extended 20 feet, passing through porphyry and stringers of quartz; total length 62 feet. It has heen discontinued. We are now running a drift from this upraise, whicb is now out 12 feet in quartz.

UNION MINE.—900 level—The Union Con. and Sierra Nevada joint north drift, which was run from the joint west drift, at a point 1520 feet west of the shaft—has heen extended during the week 16 feet; total length, 669 feet; face in hard porphyry. The joint south lateral drift from the joint west drift, at a point 1520 feet west of the shaft, has heen extended 24 feet; total length 287 feet; face in porphyry.

HYLE & NORCROSS.—975 level—Advanced north drift 13 feet; total length 50 feet; face in porphyry.

1100 level—North drift on this level was advanced 12 feet; total length 66 feet; face in quartz and porphyry.

ANDES.—420 level—The north drift from the top of the upraise from west crosscut has heen advanced 8 feet, connecting with the north upraise. We are easing timhers in main north drift on 420 level.

GOULD & CURRY—200 level—The south drift from west crosscut No. 5, 1115 feet from the northwest drift, has been extended 25 feet; total length, 240 feet; face in soft prophyry, clay and hunches of quartz.

Ferguson District.

Captain DeLamar is sinking an eight-inch artesian well to get a water supply sufficient to run the new 100-ton per day chlorination mill now building. He will sink to a depth of 3000 feet. Should it fail to develop a sufficient flow of water for reduetion purposes, a plant will be put in to pump water from Meadow valley wash. When completed this mill will work on the ores of the Monitor-Jim Crow group and the Ferguson district generally.

Kennedy District.

New Era: Tbe vein in the north drift of the winze in tbe Imperial has increased to five feet of ore, and last Thursday the men on night shift broke twenty cars of ore with two shots. Tbis ore body is said to he from 120 to 200 feet in length and pitching to the northwest. Men are heing put on in all parts of the mine to stope ore, sixty tons of which must be daily furnished the mill.

THE STEPTOE VALLAY. White Pine *News:*—The recent gold discovery made near W. D. Camphell's ranch in Steptoe valley, ahout twenty miles from Ely, is a very promisiug prospect. The ledge averages ahout four feet in width and is traceable for over a mile. The rock is a white quartz and averages ahout $20 in free gold.

OREGON.

BAKER AND GRANT COUNTIES.—*Democrat:* C. Rimhold, near Fort Sumpter, has leased his ground to a Chinese company, from which he receives $200 per week for each pipe. Sloan & Haskell made a partial eleanup ahout the first of July, and hrought $11,000 to the bank at Baker City as the result. Much of this gold ranged in size and sbape like grains of corn, hut there were many pieces weighing from $100 to $485. Last year tbey took out one piece that weigbed $1200, and their entire output was $26,000. This year they expect to take out at least $36,000. On the north fork of the John Day, in Klopp & Baisley's mine, which in the past has yielded over $210,000, two giants are kept going ten hours each day, and a double output would result from double work, but Klopp says: "What's the use? I get as much out as I need, and get more time to sleep."

Adjoining Klopp ahove the extensive property just incorporated under the name of the Granite Gravel Mining & Ditch Company consisting of a ditch 15 miles long, taken from the North Fork, carrying 500 inches with its present capacity, but the owner owns 2000 inches. They have located 840 acres of miuing ground and have a No. 1 giant at work, and the ground prospects well everywhere. Captain A. Tyler, of Portland, is in charge of the work of this company, and has enough virgin ground in sight to keep four pipes going for many years. They have 96 feet fall from bulkhead to giant, with ample dump, and the gravel is decomposed quartz and granite, free from cement, and is easily cut with a pipe.

Democrat: The gold discovery of Harahan and Heady in the Mable district promises to be one of the best properties in that vicinity. The owners have done considerable developing work on the property. They uncovered the apex, showing a 16-inch vein; then they sunk a shaft 30 feet deep, showing a 16-inch vein; then they sunk a shaft 30 feet deep, showing a well developed vein of 32 inches. They drove a tuunel 170 feet down the hill, going in 135 feet, striking an immense ledge seven feet in width of rich decomposed ore which runs from $25 to $3000 per ton. The owners are now drifting north on the ledge 125 feet; upraise to surface, uncovering the ledge about 100 feet.

IDAHO.

OSBURN.—All the mines on Canyon creek except the Black Bear and the Mammoth are at work, and the latter, it is said, will start up to-day. Nearly as many men are now working in Canyon creek as ever worked there at any previous time. The sampling works hetween Oshurn and Wallace are running two shifts, and much ore is going out direct to the smelters without undergoing the sampling process. California capitalists are looking over some Osburn prospects. It is reported they have made an offer for the Columbia, St. Elmo and California claims of $50,000, agreeing to pay $5000 cr its equivalent in work within a year from signing papers.

A BONANZA.—It seems probable, says a Boise letter, that Idaho will soon have another mine equal to the Delamar. This is the Tip Top, in Florida monntain, at Silver City. Though in a mountain long famous for rich mines, the Tip Top is an entirely new property. The owners have heen prospecting the ground for a long time. Recently they discovered the ledge and exposed 13 feet of ore worth about $20 in gold and $5 in silver per ton. The property looked so well that it attracted the attention of Colonel G. V. Bryan, the Wood River mining man. He bonded it and has since heen developing it. The original discovery was made at a depth of 50 feet. The shaft has now heen sunk to a depth of 100 feet. At this depth the ore hody is 10 feet thick and assays $217 per ton, ahout three-fourths of the value being in gold. The vein is said to closely resemhle the Delamar lode.

GENERAL NOTES.—The Silver City *Avalanche* reports that the Lincoln mill is being reconstructed to run on ore from the Tip Top mine, which was recently bonded hy G. V. Bryan.

Pierce City has heen thronged all spring and summer with adventurous gold-seekers, there being at one time 300 men in the camp. Little, however, has been or is heing done, and the travel out is ahout as great as that going in.

E. B. Lemmon, of Duluth, who has heen examining quartz and placer claims in Idaho county, has gone East. He took with him some gold from the Secesh creek placers to show prospective investors. From four pans he secured twenty-five cents. He says some wonderfully rich quartz ledges have heen discovered recently near Warrens.

The DeLamar *Nugget* says: Some of the most heautiful specimens of silver ever seen in Idaho or elsewhere were taken out of the DeLamar mines this week. They consist of masses of pure silver in the form of leaves aud moss. The leaves and sprigs are so delicate and fragile that the hunches will scarcely bear handling. They are as white and hright as burnished silver. There were several pounds of tbese heautiful specimens in the "bug" or crevice.

North Idaho *Star:* Another attempt to save tbe fine gold of the Clearwater river by a patent process has just resulted in failure. A party secured the right from the Indians to mine a har a few miles below Kamai, on the middle fork, and hauled in the machinery, including an engine and hoiler. After a two weeks' run the cleanup showed $14 in gold, certainly small pay for the seven men who were at work. Further work has been abandoned, a dollar a week heing too small pay even in the prevailing hard times.

THE CŒUR D'ALENES.—Helena *Herald:* Every day hrings some encouraging news from the Cœur d'Alene country, writes a correspondent. The latest reports are to the effect that all of the leading properties are being worked, affording employment to 1000 miners and half that many timbermen, office employes and others. The Gem employs 155 men and ships forty tons of concentrates daily. The Standard has forty-five men and an output of ten tons; the Helena & Frisco, 120 men and thirty tons; the Mammoth, twenty men and five tons; the Poorman, 200 men and forty-five tons; the Tiger, eigbty men and twenty-five tons, and tbe Bunker Hill & Sullivan, 350 men and fifty tons.

Other mines are said to be preparing to start up, and unless there is some material change in the situation there will soon he between 2000 and 3000 men at work, nearly as many as in the lively days of the camps of that section. If, as is reported, the other mines resume operations the following properties will be soon worked: Hunter, Morning, Black Bear, Custer, Sierra Nevada, Last Chance and Stemwinder.

WASHINGTON.

SLATE CREEK PLACERS.—Harry Green came in from the Methow Wednesday and reported that a rich placer strike bad heen made on Slate creek. Four men, he says, are taking out $75 a day with rockers, says the Okanogan *Outlook*. They are obliged to carry the dirt about 100 yards to water, which is supplied from tbe melting snow and is available only about four or five hours a day.

This is the placer ground reported by Mr. Yeargin last fall. The discovery was made while prospecting for a quartz ledge. Rich float was found along the creek and side of the mountain, and traced up for several hundred feet, when it suddenly ceased. Naturally the boys hegan to prospect for the lead where the float gave out, and after sinking through about six feet of "wash" found it. The ledge proved 19 feet wide and rich in gold. In testing and sampling the rock the boys made the discovery that a great deal of the gold had heen leached out of the ledge and deposited hy the action of the water in the gravel helow. There is where they have made the rich strike reported.

$3,000,000 TO DEVELOP IT.—Charles M. Fassett has returned from a ten days busines strip to the Monte Cristo mining district on the west slope of the Cascade mountains. He brought hack a numher of ore samples for assay.

"It is a wild and rugged region," he said to a Spokane reporter. "To visit the different properties one has to cross great snowfields and glaciers, scale mighty cliffs, and in places pull himself up with the aid of ropes. The town of Monte Cristo has about 500 inhahitants.

The Standard Oil people—Rockefeller, Colby, Hoyt and others—have put in there already more tban $3,000,000 of which $2,000,000 has gone into the railroad from Everett to Monte Cristo, $300,000, into the smelter at Everett and $200,000 into the concentrator near the mines. Their judgment in this gigantic undertaking is now to he put to the test. The hig mill has begun to concentrate, the smelter started Wednesday, and the work of taking out the ore is expected to go steadily forward. The company is prepared to ship from two mines—the Mystery and the Pride of the Mountains. It owns about 20 claims, hut these are the only ones upon which extensive development work has heen done. From these they are taking 200 tons of ore daily. The ore is chiefly arsenical iron, carrying gold and silver and some galena and copper pyrites.

"The outcome of this vast undertaking turns entirely upon the grade of the ore and the cost of its treatment. They unquestionahly have gigantic deposits, and if the ore can be mined, milled and smelted even at a narrow margin of profit, the results will justify the undertaking."

MONTANA.

DEER LODGE COUNTY.—*Mining Area:* The most extensive placer mining in the county is tbat carried on hy Joel P. Catching at Bearmouth. Mr. Catching started up his new flume this summer. It contains 100,000 feet of lumher. Up to within a few weeks ahout sixty men were employed on this placer. It is expected that Mr. Catching will clean up ahout $40,000 this season.

SILVER BOW COUNTY.—The Anaconda mine was sold to Daly & Haggin in June, 1881, for $30,000 hy the Hickey Bros., and was considered a doubtful proposition then. In September of 1882 the St. Lawrence, an adjcining property, was sold for $162,500. These two properties, which a little over ten years ago sold for less than $200,000, are now considered second only in amount of ore produced and value of any in the world.

All of the outside properties of the Butte & Boston are closed down with apparently little encouragement for their starting up this year.

COLORADO.

CRIPPLE CREEK MINES.—The great Pike's Peak is in honanza now. The vein in the second level has widened to fully two and one-half feet. Through this hody are streaks of ore that assay fully 100 ounces of gold to the ton.

It was the general opinion two months ago that tbe Pharmacist had been worked out. During the strike, when closed down, practi-

cally every miner that had been employed there was free to say that there was not a carload of smelting ore left standing in the mine; but 186 sacks of ore have been sent from this property that will average $100 in gold to the sack. This was all closely selected. No more ore will be hoisted from the Pharmacist for some time, owing to differences between the owners.

UTAH.

MERCUR DISTRICT: THE GEYSER.—The negotiations pending for the erection of a mill on the Geyser have been successfully closed. Messrs. S. B. Milner and G. H. Bothwell of Salt Lake have secured a half interest in the property, and will move the Milner fifty-ton mill from Bingham. The Geyser is one of the finest properties in the district. The ore averages between $8 and $10 per ton and there is lots of it. A small leaching plant has been operating successfully on its ores for some time. This enterprise will give the camp a new impetus.

NEW MEXICO.

EXCITEMENT AT BLACK MOUNTAIN. *El Paso Times*: A private letter from Black Mountain says that a new excitement, "on the side," came near depopulating the gold camp proper for a few days, and the fever is still raging. The new discoveries lie along the base of the range between San Agustin ranch and Baylor Pass, and some of the veins are traceable from one to two miles, are of workable size and carry gold, silver and lead in payable quantities at or near the surface. This is the region "ruled with an iron rod" (Winchester) last spring by the masculine gluatess of Aztec descent who kept all prospectors out as long as she remained there. A few prospectors have been at work there for the past five weeks, and the showing made by this development work caused the rush of Tuesday last.

HANOVER DISTRICT. *Enterprise*: A company of Colorado and eastern capitalists have taken a lease and option upon the Ivanhoe mine. They are sinking a large well below the mine and if a sufficient supply of water can be developed a large smelting plant will be erected and the mine worked to its full capacity for production of ore. The ore body in the mine is over 20 feet in width and averages 20 per cent copper and about $8.00 per ton in gold and silver.

The Southwestern Coal and Iron Company are shipping 50 tons of iron ore perday to the Pueblo smelters. When New Mexico iron mines can enter into successful competition in a market nearly a thousand miles away, it makes a good showing for the quantity as well as quality of the ore and is a prophetic indication of the future importance of the mines when the ores can be reduced and utilized at home, as they will be in the near future.

MEXICO.

SILVER-LEAD ORE.—Three hundred cars of silver-lead ore were standing in the railway yard at Ciudad Juarez, Mexico, toward the last of August, waiting for the new tariff bill to go into effect before transferring to the United States. Many Mexican silver-lead mines which closed down on account of the Windom ruling will now be opened up again. A decline in the price of lead will cause a number of mines to close down in the Rocky mountains.

Mining Slate.

The manner in which slate is mined and cut up for the purposes to which it is applied is a process that is known to only a few people, because slate is not found in many places in this country, its principal sources being in upper New England and eastern Pennsylvania. It is not taken out of shafts, but it is quarried out of big holes in the earth. At Bangor, Pa., these quarries are about 200 feet deep. The slate is blasted out in huge blocks and is hoisted out by steam and turned over to the men who know how to reduce it to the proper size. Huge blocks of it are taken in hand by these workmen, who cut a notch into one end of each piece. Then they take a chisel and a mallet, and they are so skillful in directing their blows that they can split the blocks of slate in almost any way they please. If one should watch the slab on which one of them is working, he will see a little hair line running through it, and presently the block will fall apart on either side of this mark. The workman will make this line go straight through the middle or to either corner just as he likes. He invariably accomplishes what he sets out to do.

The smaller pieces thus produced are taken in hand by another set of men, who split them up into sheets of the proper thickness for roof slate. This they do with a long-bladed instrument about the shape of a putty knife, but many times larger, and it is a marvel how they get the sheets off without breaking them and also how they could split them so thin. Some of these men can take a sheet of slate only one inch thick and split it thirty-two times. The usual number of divisions is sixteen. These sheets are taken and cut into squares by machinery.

Coast Industrial Notes.

—For the first six months of '94, 95,000 M ft. of pine and 55,000 M ft. of redwood were received here.

—For use in the gold mines of Johannesburg, South Africa, the Puget Sound fir is leading all others.

This year 3,000,000 acres in California are devoted to wheat raising, with an estimated yield of 30,000,000 bushels.

There is a mine of asbestos in Fresno Co., Cal., near Dry creek, which, developed, would be of value in the industrial arts.

—A year ago hops were 24 cents a pound. Three months ago they brought 17. Now they are slow of sale at 8. Overproduction!

Electricity is entering more into the motive power of San Francisco street railways. Trolley wires are now going in on Third, Kearny and other city streets, and an electric line to the ocean is projected.

—The ditch to be built across the Yakima, Wash., Indian reservation will tap the Yakima river five miles below Yakima and run eighty miles, putting about 150,000 acres of good level land under water. The survey for the definite line of location is being made.

—Recently G. J. Perkins, of Truckee, invented a water-tube boiler for locomotives. He has organized a company at La Crosse, Wis., with $800,000 capital, to manufacture it. He says it will save 25 per cent in fuel, and that properly used no fire gets through the smokestack.

—The firms of J. W. Grace & Co. of San Francisco; Grace Bros. & Co. of Lima and Callao, Peru; Grace & Co. of Valparaiso, Santiago and Concepcion, Chile; W. R. Grace & Co. of New York, and M. P. Grace of London have consolidated all their interests under the firm name of W. R. Grace & Co.

—An advance of $1 is reported in the price of fir logs on Hood's canal, now selling at $6. British Columbia mill men were reported finding more profit in buying logs on Puget Sound than in operating their own mills. Since July 1st 5,000,000 feet of logs have been shipped from Sound ports to Vancouver.

—The California Jute Mills have closed down, and the $250,000 plant is idle, it being considered useless to compete with free grain bags. Prices are considered settling to a level with Eastern figures; in the East prices are supposed to be settling to a level with those of Europe: in Europe prices are believed to be going to an Asiatic basis. Asia is still unheard from.

THE Government bounty on California beet sugar has been abolished; the Government agents are withdrawn. The three California companies think this is in the nature of a breach of contract. It was stipulated in the law that the bounty should be paid till June 30, '95. Over $2,000,000 was invested in this State in the beet-sugar business on the strength of that agreement, and the investors think they have just cause for suit in the Court of Claims at Washington.

—The fisheries of the State of Washington, including the production of oysters, clams, etc., amounted in 1893 to $1,106,226.25, as follows: Columbia river salmon, $626,071.75; Columbia river sturgeon, $77,635.50; Puget Sound fish, oysters, etc., $321,705; Willapa and Gray's Harbor, $89,814. Twenty-two coal mines in the State produced 1,208,850 tons of coal during 1893. The total value of real property in the State, exclusive of railroads, is $227,201,095; total valuation of personal property, $41,165,560; live stock, horses, 171,518 head, valued at $5,192,986; cattle, 206,372, valued at $2,980,845; sheep, 290,021, valued at $580,042; hogs, 53,487, valued at $187,211; a total live-stock valuation of $8,941,084. Telegraph, telephone and electric lines are valued at $600,891. Cable, horse and electric railways at $720,694. Steamboats, sailing vessels, etc., $1,015,721. Washington has 2824 miles of main track railway, valued at $17,286,246, and 317 miles of side track, valued at $665,131. The total acreage of timbered lands in the State is 23,588,512; feet of standing timber, 410,333,335,000; stumpage value, $269,561,329.

THE Bucyrus Steam Shovel & Dredge Company report business satisfactory both in volume and character, and state that they are running their large works at South Milwaukee, Wis., full time with full force on orders. They have lately received orders for shovels from the Messrs. McArthur Brothers Company, duplicating their previous order for the largest and most powerful steam shovel ever built either in this country or abroad, from E. D. Smith & Company, Wilson & Jackson and others. The prospects with the company for an excellent fall and winter business are very bright.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

Gold Quartz Mine For Sale.

A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which ten-dollar rock is now being crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

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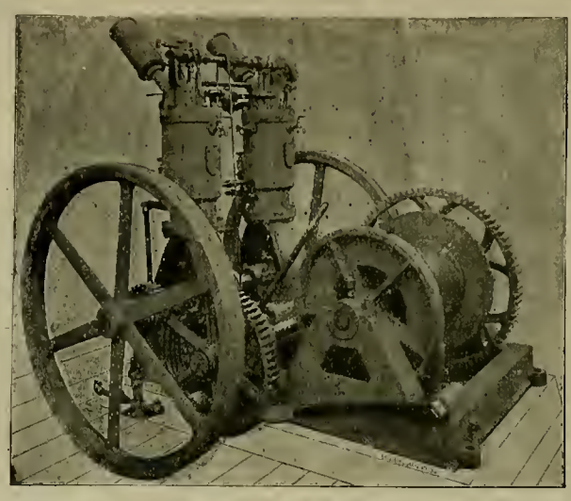

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Electrical Progress.

Electrical Voltage.

A New York reporter recently got an interesting talk from Nikola Tesla. In answer to a question from the interviewer as to what he hoped to see accomplished by means of electricity, Mr. Tesla said: "You would think me a dreamer and very far gone if I should tell you what I really hope for. But I can tell you that I look forward with absolute confidence to sending messages through the earth without any wires. I have also great hopes of transmitting electric force in the same way without waste. Concerning the transmission of messages through the earth, I have no hesitation in predicting success. I must first ascertain exactly how many vibrations to the second are caused by disturbing the mass of electricity which the earth contains. My machine for transmitting must vibrate as often to put itself in accord with the electricity of the earth."

When asked if he did not feel a little worried about taking a current of a quarter of a million volts, Mr. Tesla said:

"I did at first feel apprehensive. I had reasoned the thing out absolutely; nevertheless, there is always a certain doubt about the practical demonstration of a perfectly satisfactory theory. My idea of letting this current go through me was to demonstrate conclusively the folly of popular impressions concerning the alternating current. The experiment had no value for scientific men. A great deal of nonsense is talked and believed about 'volts,' etc. A million volts would not kill you or hurt you, if the current vibrated quickly enough—say half a million times to the second. Under such conditions the nerves wouldn't respond quickly enough to feel pain. You see, voltage has nothing to do with the size and power of the current. It is simply the calculation of the force applied at a given point. It corresponds to the actual pressure per square inch at the end of a water pipe, whether the volume of the water be great or small. A million volts going through you doesn't mean much under proper conditions. Imagine a needle so small that the hole it would make in going through your body would not allow the blood to escape. Imagine it so small that you couldn't even feel it. If you had it put through your arm slowly, that would be, electrically speaking, a very small voltage. If you had it stuck through your arm with great rapidity, going, say, at the rate of a hundred miles a second, that would be very high voltage. Voltage is speed pressure at a given point. It wouldn't do you any more harm to have a needle shot through your arm very rapidly—that is to say, with high voltage—than it would to put it through slowly. In fact, if it hurt you at all, the slow operation would probably hurt more than the other. The question of danger is simply the size of current, and yet if a big enough current should be turned against you and broken with sufficient rapidity—if it should, so to speak, jerk back and forth an inconceivable number of times to the second—it wouldn't kill you. Whereas, if applied continuously, it would simply burn you up."

THERE exists a general and deeply rooted idea that direct current dynamos of very high potential are not at all practical. This unfavorable opinion is particularly strong in regard to the use of such machines for the transmission of power for any considerable distance—in fact, such a system is considered to be almost out of the question. The actual historical and practical facts are that the high potential direct current machines were more extensively and successfully operated when the dynamo first came into general use about 1880 than any other type, either direct or alternate. Furthermore, their number and size have largely increased, and the voltage at which they can be practically worked has been steadily raised, until we now have sixty light dynamos as the standard size of large machines generating about 3000 volts and 10 amperes. Arc dynamos of ninety-light capacity are also regularly made by several manufacturers, and 120 or even 125-light machines are built and used.

THE Boston *News Bureau* quotes a large stockholder in the American Bell Telephone Company as follows: "There is actually invested in this country, either from invested capital or accumulated earnings, $90,000,000 in telephone plants. This does not earn seven per cent, and does not pay five per cent. The Bell Telephone Company, as the parent company, protects all the junior companies, makes all experiments, and, like the senior member of a mercantile firm, naturally obtains the larger proportion of earnings. The Bell Telephone will probably never consent to have its new shares sold by auction. It may wait and appeal to the new legislature, or it may go out of the State."

AN electrician compares the relative efficiency of electricity and the cable for power transmission in the following manner: A steel cable 1½ inches in diameter, traveling 12 miles an hour, can transmit nearly 2000 horse power. A copper wire with a section of one square inch will carry an electric current of 10,000 volts, at 1000 amperes to the square inch, and such a current is now being transmitted in this country. This is equal to 13,000 horse power.

Faster Transportation.

Elevated electrical railroad trains mounted upon the single steel rail of a bicycle railway may yet be whizzing through Philadelphia between Washington and New York at the marvelous rate of 120 miles an hour. Although a majority of the House Judiciary Committee recently made an adverse report upon the application for incorporation of the National Rapid Transit Railway Company, a minority report, lacking only one vote of a majority, has been drawn up in urgent advocacy of the granting of the desired charter. This report declares that Congress would only be following an old precedent in taking out of the hands of the States through which the proposed railroad would pass the authority needed. If left to the various States the ambitious scheme would probably be defeated, for both the commonwealths of Pennsylvania and New Jersey require a majority of the directors of a railroad chartered in either of those States to be residents therein.

There is nothing startling in the mechanical principles which would be involved in the construction of this contemplated railroad. There is now invested in the United States in electric roads capital exceeding $205,000,000. The bicycle plan has been successfully operated on a minor scale. It is the vastness of this enterprise that almost staggers belief. That the motion of a train running on a roadbed of iron or steel with a single rail in the center and side rails reaching under the sills of the car windows in a trough-like fashion might be very much smoother and safer than the present track system does not seem unreasonable, and is, at least, worthy of thorough investigation and trial. The center of gravity would be upon the supporting rail; the pointed cars would minimize the air pressure, and the gearless electric motors would greatly diminish the friction. The railroad of to-day would seem to have reached the limit of its speed possibilities. With this proposed roadbed and rail principle 120 miles an hour might be only the beginning of a new era of racing ahead of the wind.

WITHIN the past twelve months the price of silver per fine ounce has declined over 14%. The price of leather has declined in about the same ratio, pig iron about 13% and wool about 17%. In the price of these commodities the decline has been in about the same proportion as that of silver.

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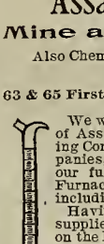

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents of the Denver Fire Clay Co. and for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

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J. F. CROSETT,

Commission Mine Broker,

628 SACRAMENTO STREET.

I have five customers looking for income-paying mines for London, to be valued from $300,000 to $5,000,000. I also want ten income-paying properties for customers residing in San Francisco, Chicago, Denver, New York and Philadelphia. Owners of mines desiring to sell can make quick sales by seeing or writing me. I also invite investors to consider properties I have to offer.

Quicksilver For Sale

At Lowest Market Prices.

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—FOR SALE BY—

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LIMITED.

TRADE MARK.

(MACARTHUR-FORREST PROCESS)

MacArthur-Forrest Process.

CAPITAL, - - - £110,000 STERLING.

To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.

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FOR SEVENTY-FIVE DOLLARS

This College instructs in Shorthand, Type-Writing, Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils. Our school has its graduates in every part of the State. Send for Circular. C. S. HALEY, Sec.

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STEAM ENGINES, BOILERS,

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MACHINERY FOR MINING PURPOSES.

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INVENTORS, Take Notice!

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26 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

LIGHTNING / LARGEST WELL MACHINERY Works.

All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

Practical Information.

Our Little World.

If our sun were removed to the Pleiades it would hardly be visible in an opera glass with which nearly 100 stars can be seen in the cluster. Sixty or seventy Pleiades surpass our sun in brilliancy; Alcyone being 1000 times more brilliant, Electra nearly 500 times and Maia nearly 400. Sirius itself takes subordinate rank when compared with the five most brilliant members of a group the real magnificence of which we can thus in some degree apprehend. To know the dimensions, not of the individual stars, but of the cluster itself, occasions difficulties; but on the assumption that it is approximately spherical in shape, its dimensions can be calculated at 40,000,000,000 miles. Taking the dimensions of our solar system by themselves, or in relation to terrestrial matters, they appear stupendously enormous. Neptune, the most distant known member, has an orbit over 5,000,000,000 miles across, but the solar system is to the Pleiades but as a Lilliputian to a Brobdignagian—is but a microbe to a mountain—for a sphere the size of the solar system would, if spherical and its diameter that of the orbit of Neptune, be relatively so minute that it could be contained more than 400,000,000,000 times in a sphere the size of the Pleiades; in other words, the limits of the Pleiades could contain 150 solar systems as many times over as there are miles between Neptune and the sun.

It must not be forgotten that though there are 2500 stars in the cluster, yet with such dimensions for the entire group, vast distances must separate the stars from one another. In fact, 2300 spheres, each with a diameter of 5,000,000,000 miles, could be contained in the limits assigned.

A Nuvel Bridge Test.

A novel bridge test to destruction is reported by the German papers as occurring at Wohlhusen, on the Jura-Simplon railway of Switzerland. The structure was built over the Emme river in 1874, and greatly resembled the bridge belonging to the same company at Moenschenstein, which failed in June, 1891. The Wohlhusen bridge has proved too light for the trains coming upon it of late, so the railway company decided to replace it by a heavier structure. Owing to the similarity between it and the Moenchenstein bridge, it was decided to test it to destruction The trusses are stated to have been 157 feet long and 19 feet high, while those of the Moenchenstein bridge were 138 feet long and 20 feet high. The tests were made by uniformly loading half the bridge with rails and gravel. The loading was begun April 9th and continued daily until April 24th, when slight changes of form began to occur under a load of 7800 pounds per linear foot. By 9 A. M., April 25th, the load had been raised to nearly 9400 pounds per linear foot of half the bridge, and there were numerous small cracks, although no indications of the particular point at which failure might occur. Forty minutes later, however, there was a sudden crash, said to resemble a peal of thunder, and the bridge collapsed so suddenly that the manner of its fall could not be observed.

Photographic Plates that Won't Frill.

One of the most vexatious experiences of the amateur photographer is to discover after properly guarding his plates from light, exposing them accurately and developing them correctly, that the gelatine film has loosened itself in part from the glass backing and begun to pucker or frill. This trouble is more likely to occur in hot weather than at any other season, and that is just when a man is most likely to use his camera. A number of recommendations have been made to help obviate the evil. Some experts advise using iced water; others say that certain chemicals added to the developer, or fixer, will serve as a preventive. Lately, however, some plates have been invented which, it is said, will stand a temperature of 212° Fahr. without frilling. The editor of the *Photographic Times* declares that he has tried them in water having a temperature of from 140° to 160° with great success, and that is much hotter than the liquids any photographer ordinarily uses even in summer.

A DISPATCH from New Haven, Conn., says, all reports to the contrary notwithstanding, the arms companies in that city expect to reap a rich harvest from the shipments of weapons for the Oriental war. Two weeks ago a test case was made by the Winchester Company. Two members of the Chinese legation visited the factory of the company, bought a large order, which was shipped for China via Vancouver immediately, and the action of the Government was awaited with anxiety. None has been taken, and it is now believed that free shipment of arms to the belligereuts from the United States will not be interfered with.

THE Minas de Tajo mines, located about eighty miles from Mazatlan, a Pacific seaport town of Mexieo, have been worked coutiuuously siuce 1536. They now have forty miles of tunnels, and are working 900 meu.

THE French Academy of Sciences has the sum of $10,000, to be awarded the iuventor of a simple and sure method of determining fraud practiced iu the production of alcoholic liquor for human cousumption.

COREANS are credited with building the first ironclad, about 300 years ago.

IN 1893 the total value of the mineral production of Canada was $19,250,000.

No. 6.

FRASER & CHALMERS, CHICAGO, ILL., U. S. A.

Also 43 Threadneedle St., E. C., London, England.

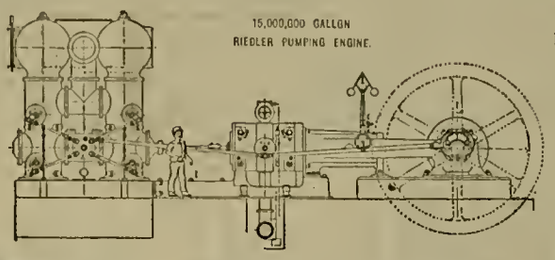
BRANCH OFFICES:

2 Wall St., New York; City of Mexico, Mexico; Salt Lake City, Utah; Helena, Montana; 527 17th St., opposite Denver Club, Denver, Colo.

We have in preparation an interesting pamphlet giving numerous cuts and descriptions of RIEDLER Pumping Engines and Air Compressors in America and Europe.

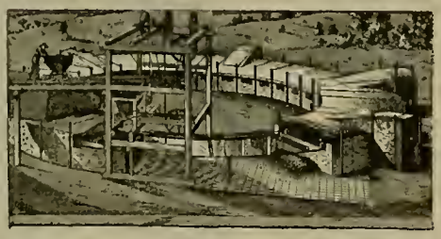
Metallurgists are invited to send for our pamphlet explaining the great merits and economy in use of the

Horace F. Brown Horseshoe Roasting Furnace.



15,000,000 GALLON RIEDLER PUMPING ENGINE.

Let us book your address to receive this on publication.



Crushers, Pumping Engines, Boilers, Lead Smelters, Gold Mills, Hoists, Corliss Engines, Mechanical Stokers, Pyritic Smelters, Silver Mills, Mill and Mine Supplies.

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CASCADE WATER WHEEL

EMBODYING IN PRINCIPLE THE

Hurdy-Gurdy or Impulse Wheel

ADAPTED TO ALL HEADS FROM

30 FEET to 2000 FEET.

Our experience of **33 Years** in the water wheel business, enables us to suit every requirement of Water Power Plants. Send for Illustrated Pamphlet.

This New Wheel has given an Unequaled Economy in Water.

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MANUFACTURERS OF

Mining Pumps, Pan Staves, Leaching Tanks, and also the famous

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The best and cheapest on the market, and for strength and durability unsurpassed.

Send for Catalogue. 51 Beale St., San Francisco.

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Two Mines of Free Milling Gold Ore.

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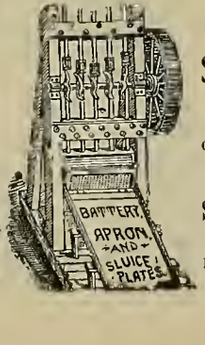

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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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653 and 655 Mission Street, San Francisco, Cal.

E. G. DENNISTON, - - - - - - - - - - Proprietor

Every description of work plated. Send for Circular.

Market Reports.

The Markets.

SAN FRANCISCO, Sept. 6, 1894.

The oscillations of the week's silver pendulum were slight, the fact that the market held its own being taken as evidence of strength. Japan is importing large quantities of silver for coinage. For the 90 days ending June 30th the Japanese mint received over 10,000,000 ounces foreign silver, and is turning out over 100,000 yen daily.

In the twelve months ended June 30, '94, there was exported from this country to Hong Kong $8,812,054 of silver coin and bullion, and to Japan $4,074,547 of silver. That was sent from this city. From New York in the same period was sent $36,557,045 of silver coin and bullion, of which $35,107,908 went to England. New York silver trade with the Orient generally is via England, and therefore how much of that $35,107,908 went to China and Japan cannot be statistically given. Probably of the whole amount of silver exported $11,250,000 consisted of Mexican dollars. Silver has been, comparatively speaking, scarce in the Orient since the closing of the India mines. It is for that reason that the Hong Kong and Shanghai Banking Company recently requested permission from the British government to coin some more silver dollars. The Hong Kong dollar, as it is called, is worth four cents more than the United States silver dollar, eight-tenths of a cent less than the Mexican dollar, and one cent less than the old trade dollar. The Mexican silver dollar is therefore worth 4 8-10 cents more than the United States dollar, on the assumption, of course, of the parity of the American dollar. United States exports of silver to England in the year ending June 30, 1894, exceeded those of the previous year by about $10,000,000. United States exports of silver to Japan, however, were about the same. English statistics show that for the six months ending June 30, 1894, the exports of silver from England to China (including Hong Kong) amounted to £2,132,458, as compared with £187,290 for the corresponding period last year. The exports of silver to Japan from England for the six months ending June 30, 1894, were £573,300, as against £462,700 for the corresponding period in 1893.

An unlimited demand for Mexican dollars is reported in London. The London *Times* is authority for the statement in its issue of August 22d, that there are no supplies of Mexican dollars there; at any time during the last sixty days they could have been sold at from four to ten per cent premium on silver.

During the fiscal year the United States gold coinage was $99,599,911—the largest in the history of the nation. The silver coinage for the year aggregated $5,879,490.

The net exports of gold from July 1, 1893, to July 1, 1894, were $4,500,000. The gold production of the country for the same time was about $36,000,000, being 2,955,000 increase over the previous year. From this may be deducted $13,000,000 used in the arts. On this basis there is a net increase of $18,500,000, making the total supply of gold for monetary uses in the United States $682,775,335. This country exceeds in the magnitude of its gold supply all other countries but France, which has upward of $800,000,000. Germany and Great Britain have each about $600,000,000.

There is little new to report in lead, copper or tin. The peculiar methods of the New York Metal Exchange, given at length in last week's issue, regarding the manipulation and withholding of the prices current of lead, are as yet unforgotten but unexplained.

Reports from all the producers of lead in the United States to hand to-day, furnished by the United States Goverment Mining Statistics Bureau, show that the production of that metal has been as follows during the first six months of 1894:

	Net tons.
Desilverized lead	86,772
Soft lead	15,610
Total production refined lead	102,382
Refined in hond	21,382
Available for home market	80,990
Contents of Mexican and Canadian ores	9,786
From American sources	71,204

Included in the above desilverized lead are 2375 tons of hard lead produced in the first half of 1894, as compared with 2401 tons of antimonial lead during the first half of 1893.

The most striking feature in the statistics presented is the heavy falling off in the quantity of lead drawn from domestic sources. It proves that the decline in the price of lead and the prostration of the silver mining industry have seriously affected the lead industry of the Rocky Mountain States and Territories.

The stocks of lead in refiners' hands have only been partially reported. Those received show a total of 2655 tons on July 1, 1894, as compared with 2468 tons on January 1st. The stock of soft lead was 2060 tons in the beginning of the year as compared with 1880 tons on July 1, 1894.

Quicksilver escaped the blight that some California industries suffered from the new tariff, the $5 a flask duty representing to the producer that amount of protection for his home product. The price, local, remains at $36.

New York Prices.

NEW YORK, Sept. 6.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	30¼	66⅛	....	....	.....
Friday	30¼	65¾	9 15	3 20	19 50
Saturday	30¼	65¾	9 20	3 25	.....
Monday	30¼	65¾	....	....	.....
Tuesday	30⅛	65½	9 15	3 20	19 50
Wednesday	30⅛	65⅜	....	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86½
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	65⅝
Mexican Dollars, nominal	54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	12
BORAX.			
Refined, in car lots	—	@	8
Powdered, "	—	@	8
Concentrated, "	—	@	7
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, johhing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	15 00	@	16 00
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	5
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 55
Drop, B and *larger* sizes, "			1 75
Buck, Balls and Chilled, do, "			1 85
QUICKSILVER.			
Home trade, per flask	35	87½@	36 00
STEEL.			
English, lh	14	@	16
PIG TIN.			
Per lb	21	@	22
COAL. SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 75
Coos Bay			5 50
Cannel			8 00
Egg, hard			10 00
Wallsend			7 00
Scotch Splint			7 00
Brymbo			7 25
West Hartley			8 25
TO ARRIVE—PER TON.			
Australian	5 75	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 25	@	— —
Lehigh Lnmp	8 50	@	— —
Cumberland	8 00	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 25	@	— —

The coal market is dull. From Jan. 1st to July 1st, '94, 336,231 tons bituminous coal have been imported. The yards are all full and 127,438 tons are engaged to arrive. The general holding off from buying makes business stagnant, it being the universal belief that in December Congress will take off the duty retained on coal in the bill just passed.

Mining Share Market.

SAN FRANCISCO, Sept. 6, 1894.

While the encouraging appearance of some of the Comstock mines is ackuowledged on all sides, their good condition has little to do with the stock, not near so much as the general absence of coin from the street. The Gold Hill end showed considerable strength during the week, and it is thought the resumption of the mills next week will be of good effect. The Con. Cal. & Va. during August furnished the Morgan mill 2497 tons of ore, which yielded $23.66 gold and $32.39 silver to the ton; $59,092 gold and 80,907 silver, a total of $139,999. The average assay of the car samples was $64.15, and of the battery samples $56.28.

During September $143,400 assessments are called for. Of this, the Comstock asks $95,400; Arizona, $30,000; Mexico, $4000; California, $14,000.

On the 3d the following reported cash balances on hand as annexed:

Alpha	$5,031	Julia	$668
Alta	1,062	Justice	37
Andes	16,229	Kentuck	1,718
Belcher	4,700	Lady Washington	16
Best & Belcher	13,461	Mono	1,678
Bullion	1,921	Mexican	16,943
Bulwer	5,125	Navajo	230
Bodie	28,898	Nevada Queen	659
Caledonia	5,934	Occidental	533
Challenge	1,067	Ophir	4,670
Chollar	1,060	Overman	7,948
Con. Imperial	1,966	Savage	15,196
Confidence	3,739	Scorpion	455
Con. New York	2,859	Seg. Belcher	7,939
Con. Cal.	93,143	Silver Hill	206
Crown Point	9,356	Sierra Nevada	22,884
E. Sierra Nevada	573	Standard Con	28,975
Exchequer	3,637	Syndicate	901
Gould & Curry	13,978	Union Con	12,333
Hale & Norcross	18,789	Utah	639

The following companies reported an indebtedness on the same date:

Belle Isle	$1,263	North Belle Isle	$2,037
Commonwealth	18,232	N. Commonwealth	2,353
Grand Prize	589	Potosi	192

The following illustrates the changes of the week:

MINES.	30	6
Utah	$	$ ....
Sierra Nevada	99	1 05
Union	73	71
Mexican	1 10	1 20
Ophir	2 20	2 30
Consolidated California and Virginia	4 05	4 25
Best & Belcher	1 25	1 35
Gould & Curry	72	72
Savage	65	65
Hale & Norcross	64	.....
Chollar	25	20
Potosi	42	65
Bullion		12
Exchequer		....
Alpha	09	....
Confidence		1 00
Yellow Jacket	42	72
Crown Point		71
Belcher	82	83
Overman		22
Justice	21	33
Alta Consolidated		.....
Consolidated New York		.....
Challenge	36	37
Bodie	1 55	1 50
Andes	53	55

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Bay State M & D Co, Cal	22	3c	Aug 25, Sept 29, Oct 24	F E Luty, 330 Pine
Brunswick Con G M Co, Cal	7	2c	Aug 22, Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7, Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	20c	Aug 9, Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27, Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17, Aug 24, Sept 21	C C Harvey, 309 Montgomery
Ophir S M Co, Nev	63	25c	Sept 5, Oct 9, Oct 29	E B Holmes, 309 Montgomery
Overman S M Co, Nev	71	10c	Jnly 17, Aug 21, Sept 11	G D Edwards, 414 California
Potosi M Co, Nev	42	25c	Aug 2, Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24, Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	20c	July 27, Aug 30, Sept 19	E B Holmes, 309 Montgomery
Sierra Nevada M Co, Nev	107	25c	July 18, Aug 22, Sept 11	E L Parker, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31, Sept 11, Oct 3	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2, Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Gray Eagle M Co, Nev	C C Harvey, 309 Montgomery	Sept 19
Mono G M Co, Nev	M E Willis, 309 Montgomery	Sept 20

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 6, 1894.

FIRST SESSION—9:30 A. M.

100 Andes	51	10		4	00
200	50	100	G & O		65
300 Belcher	77	400	Justice		33
100 Best & Belcher	1	20	150 Ophir	2	10
250 Bullion	12	200	Potosi		61
100 Caledonia	14	400	Savage		63
200 Crown Point	71	200	Seg Belcher		14
200 Chollar	19	300	Yellow Jacket		69
200	18	150			70
50 Con Cal & Va	3	95			

SECOND SESSION—2:30 P. M.

300 Andes	55	100	Justice		31
100 Belcher	83	400			32
50	82	350	Mexican	1	20
200 Best & Belcher	1	35	100 Overman		22
100 Bodie	1	50	250 Ophir	2	25
600 Bullion	12	350		2	30
200 Challenge	37	100	Potosi		65
125 Chollar	20	300	Savage		65
505 C. C. & Va	4	25	200 Sierra Nevada	1	00
100 Confidence	1	00	300 Union		71
100 Gould & Curry	72	250	Yellow Jacket		72
200 Julia	2	50			71

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 28, 1894.

525,067.—GRAIN SEPARATOR—Bailey & Gilson, Sheridan, Or.

525,127.—SQUIRREL EXTERMINATOR—T. R. Barney, S. F.

525,130.—MOTOR—J. H. Boyd, Waterville, Wash.

525,062.—WATER-WHEEL—P. S. Buckminister, Angels, Cal.

525,096.—CULTIVATOR—R. V. Dorsey, Watsonville, Cal.

525,097.—TILE CONSTRUCTION—J. A. Flint, S. F.

525,100.—CAN-HEADING MACHINE—J. Gould Jr., S. F.

525,104.—WATER CLOSET—S. S. Herrick, S. F.

525,300.—ROPE-DRIVING APPARATUS—J. H. Houdley, S. F.

525,112.—FRUIT CRATE—R. E. Morey, Oakland, Cal.

525,154.—SHOE AND GLOVE BUTTONER—Ida E. Mnshette, Oakland, Cal.

525,122.—BOOM FOR LOGS—W. F. Stevens, S. F.

525,244.—FLUSHING APPARATUS—F. Walker, Los Angeles, Cal.

525,065.—DECAPPER—W. A. Wright, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FRUIT CARRIER.—Isaac B. Wollard, San Francisco, Cal., assignor to Wm. B. Lake, of same place. No. 524,625. Dated Aug. 14, 1894. This invention relates to a carrier for fruit, eggs and other fragile, delicate or perishable substances. It consists of a series of compartments having inclined elastic sides and elastic pieces extending above and below the compartments so that the fruit is properly held within these compartments and prevented from shaking from side to side or coming in contact with the fruit in the adjacent compartments. Dove-tailed slots in the partitions, running in one direction, serve to receive those extending across them, and they are secured by locking strips. Each series of these partitioned chambers is separated from those above and below by horizontal partitions, perforated so as to allow a free ventilation th ough the whole case.

MEANS FOR TREATING CITY REFUSE.—E. L. Ransome, Oakland, Cal. No. 524,688. Dated Aug. 14, 1894. This invention is designed to neutralize the cinders which are produced by burning city refuse in furnaces constructed for the purpose. It consists in breaking, regulating the fall of and crushing the burned material antomatically and contemporaneously with its removal from the furnace. The apparatus consists of a furnace of considerable diameter and great height within which the material is burned, and the breaker is in the form of a grate situated in the lower part upon which the clinker formed by the burning descends. Through this breaker adjustable bars pass fixed at an angle, and the breaker itself is rotated slowly by power applied to it in any convenient manner, so that the projecting bars will engage the clinker and break it up into smaller parts, which afterward fall through to separating and distributing devices below.

ATTACHMENT FOR ARTESIAN WELLS.—Francesco Cavallaro, San Jose, Cal. No. 524,666. Dated Aug. 14, 1894. This invention relates to attachments for artesian wells. The object is to provide a means for hermetically closing the tubes of the wells so that, in the case of a flowing well, the water may be stopped at any time, and in case the well has to be pumped, the well tube itself will serve as an extension of the suction pipe of the pump. It consists of a disk and expansible collar adapted to fit the interior of the well tube and an expander and mechanism whereby it is moved to expand the collar or allow it to contract, a pump suction tube extending down through the disk upon which the expander is slidable, a valve or plug, guides below the disk upon which the plug is movable, and a screw engaging a nut and adapted to move the plug to close or open the bottom of the pump tube, and screw shanks extending upwardly by which the expander is adjusted.

BOOM FOR HOLDING AND TOWING LOGS OR TIMBERS.—W. F. Stevens, Sau Francisco, Cal. No. 525,122. Dated August 28, 1894. The object of this invention is to provide a simple and effective device for holding together well a mass of logs or timbers and towing them to their destination. The boom is composed of short, longitudinally-bored logs, connected in a series by an endless chain passing through their bores and provided with adjustable stops for regulating the spaces between the boom logs. The logs or timbers to be towed are confined loosely within the boom which being moved carries them along.

FIREPROOF TILE CONSTRUCTION FOR WOODEN BUILDINGS.—J. A. Flint, San Francisco, Cal. Assignor of one-half to P. J. Horan of same place. No. 525,097. Dated August 28, 1894. In this construction hollow tiles are used. The wooden supports, such as the studding, the joists, or the rafters, have secured to them on opposite sides, cleats and also guide pieces separated from the cleats by a space. Into this space the back walls of the hollow tiles fit, their front walls being separated from the faces of the supports and the guide pieces by an air space. Thus the tiles are fully separated from the wood at all places where heat could be communicated.

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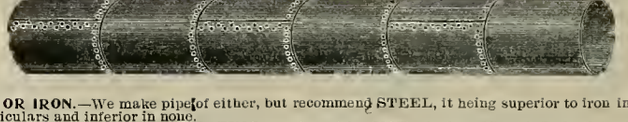

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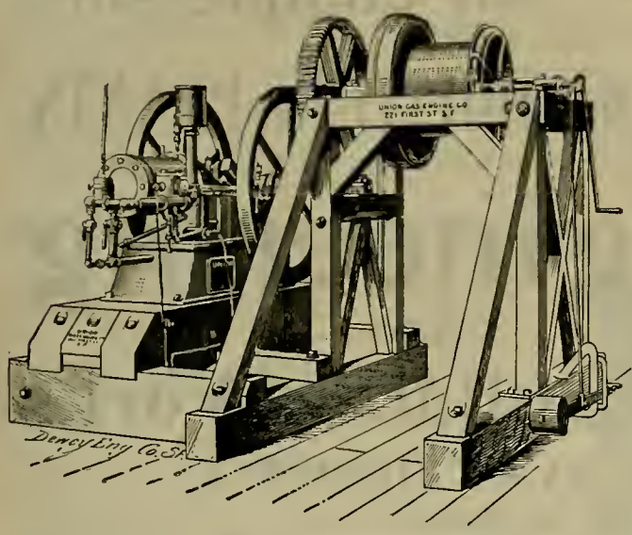

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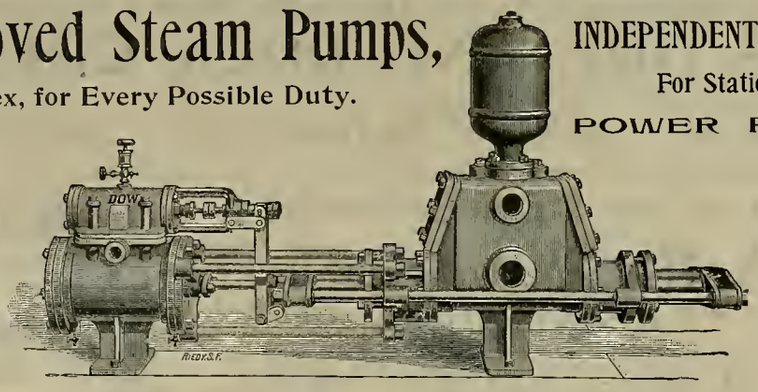

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 11. SAN FRANCISCO, SATURDAY, SEPTEMBER 15, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Austin Dam.

The dam across the Colorado river, at Austin, Texas, which has recently been completed, is a work of great magnitude and of much scientific and practical interest. Fig. 1 showing the water pouring over the dam is made from a photograph taken a short time before the work was finished. This dam holds back a body of water forming a lake twenty-four miles long, furnishing water power that will add much to the future importance of Austin as a manufacturing center.

The survey for the dam began in May, 1890. The contract for its construction was awarded in October of the same year, and the work of excavation was commenced at once. The first stone was laid in May, 1891, and the dam is now completed. It is 1150 feet long, 68 feet in height, 66 feet wide at the base and 16 at the top, cost about $608,000, and will furnish 14,500 H. P. for sixty hours per week. Both up-stream and down-stream faces are constructed of granite, and the interior is of limestone, all laid in Portland cement mortar, three parts sand to one of cement.

In the construction of the dam, an overhead cableway, 1850 feet long, with a span of 1350 feet, was used—the longest span of the kind ever operated. The cable was two and one-half inches in diameter, and was suspended from towers on the bluffs on opposite sides of the river, the easterly tower being considerably higher than the other. The granite and other material were hoisted from a railway on the eastern side to the cableway and moved to the desired part of the dam by means of a suspended carrier operated by a hoisting engine in the eastern tower.

The power house is situated at the eastern end of the dam, water being taken from the lake through eight nine-foot penstocks, some of which are shown partly completed in the engraving. The power plant is 24,000 H. P. There are two pairs of 4,000,000-gallon pumps, the latter to furnish water for a 100,000,000-gallon reservoir for the city water works. A pair of the turbines are shown in the accompanying Fig. 2. They are on horizontal shafts, with two feeders and central discharge. This plant will furnish power for a complete system of electrical distribution for Austin, including lighting, street-railway service, and power for manufacturing purposes. The pumps are horizontal double-acting ones of the plunger type, having two pump cylinders to each pair. They are driven by two vertical turbines of 200 H. P. each, under 54 feet head, the shafts being connected to the pumps by bevel gears.

The cost of the entire work, including reservoir, distribution system, power house and dam, is not far from $1,400,000, the pumps and turbines alone costing $70,000. About forty miles of pipe, ranging in diameter from two feet to six inches, were required in the distribution system for the city water works.

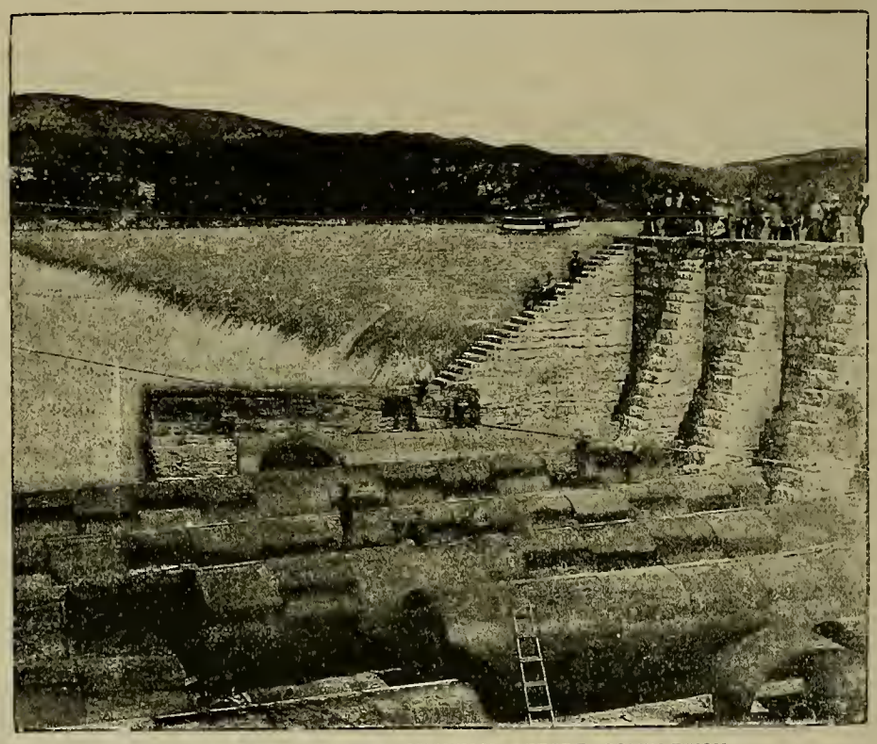

Fig. 1.—THE AUSTIN DAM SHORTLY BEFORE COMPLETION.

Fig. 2.—TURBINES AT THE AUSTIN DAM.

BABBITT METAL, or what is called "babbitt metal," like wine or saleratus, can be made at any price, but what may be styled genuine babbitt metal is of standard make and definite components. Among a variety of formulas it is believed the following meets all the requirements of genuine babbitt metal: Melt separately 4 parts copper, 12 Banca tin, 8 regulus of antimony. After fusion add 12 parts tin. The antimony should be added with the first portion of the tin, and the copper added after taking the melting pot from the fire. The surface of the charge should be protected from oxidation by a covering of powdered charcoal. This mixture constitutes the "hardening," and the babbitt metal is made by fusing one part of this "hardening" with two parts of tin, thus making the metal consist of 3.7 parts copper, 7.4 parts antimony and 88.9 parts tin.

HORSES are slow of sale in California just now, in some cases it being found difficult to give them away. Apart from the price of feed, the law of supply and demand has a good deal to do with it. In slow-going Philadelphia the electric street railway is being introduced, and in time the horse market there will be as dull as elsewhere. An accurate estimate of the number of horses in the various Philadelphia street car stables indicates that from 12,000 to 13,000 animals will in all have been thrown upon the market after the electric wire has been generally substituted. On an average, 120,000 pounds of long hay and at least 114,000 pounds of cut hay is consumed.

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San Francisco, September 15, 1894.

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THE Queensland, Australia, government has voted £10,000 for deep sinking on various mining fields in that colony.

CONGRESSMAN CAMINETTI has not lost hope of the ultimate success of his restrainiug dam proposition, the appropriation for which was stricken out of the last river and harbor bill, aud says that members of the Senate aud House committees will be out here next November.

"CAN gold be found iu payiug quantities in a volcanic couutry?" asks a San Bernardino man. That depends. The consensus of scientific opinion is that gold is almost if not quite unknown as a volcanic product. It is believed that gold, when found in a volcanic country, is there rather iu spite of than because of the volcanic character of the country.

EVERY paper in the mining counties of the State chrouicles uuusual activity in mining matters—old locations chauging hauds at fair prices; large quantities of improved machinery being put in; new discoveries makiug; and a general spirit of energy and hopefulness pervading every section. Quartz and placer districts are alike lively, and without any rush or hurrah there is a geueral resumptiou of the mining industry all over the State.

LOUIS JANIN, JR., left London on the 1st inst. for Victoria, N. S. W., with a view of iutroducing modern American improvements into Australian gold mills. Believing that uo single type of treatment is suited to all ores, it is his purpose to introduce new processes where he cannot improve npon existing ones, the greater portion of his work being inteuded to add American improvements to already existing plants without materially altering the systems there in present use.

REPORTS from Western Australia, where it is asserted gold is lying iu chunks waiting to be picked up, indicate considerable anxiety on the part of many to be the first there. That anxiety is said to be shared by some possessed of surplus funds with whom the "promoter" is having present financial enjoyment. It is to be hoped that every word of the glowiug accounts is true, and yet, at this distance, or any distance, the reports must be largely discounted. Shonld there be no result of disappointed gold seekers and ruined investors, the usual history of such sudden El Dorados will have been reversed. Of conrse our Australian friends will not fail to recognize the usual percentage in favor of the game.

One Reason.

It is often asked why so many of Califoruia's useful minerals are not more completely utilized. It is a question easier to ask than to answer, the reasons are so mauy and covering so wide a field. Throughout the great area of the commonwealth, beside the gold, silver, quicksilver, lead, coal, copper and iron, are found asbestos, antimony, asphaltum, borax, cement, chromium, fire clay, gypsum, manganese, marble, magnesia, mica, petroleum, salt, soda, sulphur, etc., etc. It must not be supposed that, apart from the precious metals, the mineral wealth of the State has been overlooked. Much has beeu done and is doing in the way of development and manufacture. Apart from the questions of wages, transportation, quality, production, demand, and other factors that enter into the equation, seems paramount the question of profit.

Twenty years ago the question was raised, why had the United States so completely abandoned the ship building business; the carrying trade; the ocean freight traffic. Like other business questions it was run into politics and found place in partisan platforms. Looking at that question in the light of history it would seem that American capital abandoned so completely the ocean carryiug trade becanse the money could be made earn twelve per cent in railroad building and inland development when it would earn but four per cent when put into marine architecture. That railroad building, land plattiug, townsite industry has received a check. The days of rapid railroad building are now looked upon as a past era.

Similarly, it is believed, the reason for the neglect of some of our State's natural mineral resources was simply because money was to be made quicker and plentier in other pursuits. No sooner had the first goldeu flood begun to slacken than there came a silver shower from the other side of the Sierras that distracted atteution from the smaller rills that feed the river of the State's mineral wealth.

"Despise not the day of small things," was an adage not generally observed by Californians. In overturuing hills, changing river beds and tunnelling mountains, the Californians of the era now passing away had no time to develop minor sources of mineral wealth that yet await successful working.

Many of these mineral resources still await the manufacturing epoch, which with less expectations on the part of both labor and capital will take its place in the State industrial calendar.

These mineral resources are not only varied but widely aud evenly distributed, and are unusually easy of access. Of a uew mining camp in Nevada it used to be said that "it ought to be good, 'tis so hard to get there." In Mexico and South America the best mines can only be reached by steep and difficult trails. In California the principal gold belt has an average altitnde of 2000 feet, and it is a well-known fact that oue of the chiefest charms of residence in the gold districts of this State is the beauty of the climate and the ease of access.

The wide distribution of the mineral resources of California is remarkable. Every county in Califoruia has valuable mineral deposits. In 35 of the 57 counties gold miues are in operation, and in ten of these counties are gold and silver mines. Quicksilver is found iu Santa Clara, San Luis Obispo, Napa, Lake, Sonoma, and, it is believed, in Trinity. These are the ouly cases where cinnabar ore is worked in the United States.

What is said of the mineral resources of this State applies with equal force to Nevada, Arizona, Oregou, Utah, Montana and Idaho. Upon the successful development of those mineral resources depends the growth of other industries and the general prosperity of the coast.

AT a meeting of the Technical Society of the Pacific Coast on the 7th inst., Mr. H. B. Bestor read an article on "City Tenemeuts," and Mr. R. L. Dunn read a paper ou "The Relation of Transportatiou to Production," which elicited considerable interest and comment. The central idea was that some way should be adopted to change the present custom, which according to the deductions in Mr. Dunn's article, gives transportation half the amount received for California's agricultural and horticultural products.

Statistics of the Currency.

A statement has been prepared at the Treasury Department giving the amount of specie and banknote aud paper circulation of the United States iu years specified from 1800 to 1859. From the latter year the figures have formed a part of the report of the Secretary of the Treasury.

The estimated specie at the beginning of the century was but $17,500,000, and the total of all kinds of mouey was but $28,000,000. The population was then only 5,308,483. The specie iu 1835 had increased to $51,000,000, and all kinds of money to $154,692,495, and the population to 14,786,000. The table shows the per capita circulation as follows:

Year.	Per Capita.	Year.	Per Capita.
1800	$4.99	1861	$13.98
1801	7.60	1862	10.23
1820	6.96	1863	17.84
1830	6.69	1864	19.67
1831	7.04	1865	20.57
1832	8.64	1866	18.99
1833	8.60	1867	18.28
1834	8.64	1868	18.39
1835	9.86	1869	17.60
1836	13.17	1870	17.50
1837	13.87	1871	18.10
1838	12.33	1872	18.19
1839	13.26	1873	18.04
1840	10.91	1874	18.13
1841	10.50	1875	17.16
1842	9.02	1876	16.12
1843	7.87	1877	15.58
1844	8.68	1878	15.32
1845	8.95	1879	16.75
1846	9.43	1880	19.41
1847	10.50	1881	21.71
1848	10.66	1882	22.37
1849	10.34	1883	22.91
1850	12.02	1884	22.65
1851	13.76	1885	23.02
1852	14.63	1886	21.82
1853	15.80	1887	22.45
1854	16.10	1888	22.88
1855	15.34	1889	22.52
1856	15.16	1890	22.82
1857	15.81	1891	23.41
1858	13.78	1892	24.44
1859	14.35	1893	23.85
1860	13.85		

THE weekly accounts in these columns of the investment of capital in gold mining properties all over the State indicate from the character of the property bought that undeveloped mines meet with ready sale. Owners who have a bullion-producing mine don't want to sell; as a rule their mine is not on the market. Holders of "prospects" or undeveloped properties realize that it is idle to hold at prohibition high figures. Capital, generally, finds more present profit in mines than in other forms of investment, aud sees opportunities for placing idle capital where it will meet with good returu. It has beeu customary (more especially with English investors) to decline taking hold of anything but "a going concern," but now-a-days "a coming conceru" is not overlooked. And, in general, where due care is exercised, the element of risk in buying a mining claim to develop it, is very small; and where every appliance for working the mine is so cheaply procurable as in this State, it is no wonder that the gold claims of the State are being so rapidly picked up by iuvestors.

COMMENTING on hard times and their causes, the Oaklaud *Tribune* cites the Sawyer decision which stopped hydraulic miniug in the Sierras. That decision drove thousands of miners out of the mountains, emptied miuing towus of their inhabitants, left property which had cost over one hundred millions of dollars to develop to go to wreck and ruin, and lopped off about ten million dollars from the annual income of the State. The State has thus, through that one industry, lost a total sum to date of about $150,000,000. During the last year or two the revival of quartz mining has brought to the State an increased income of between $3,000,000 and $4,000,000 annually, thus reducing the loss chargeable to judicial interference with mining operations to $6,000,000 or $7,000,000 per annum; that is, the State is still the latter amount out in its annual income from the miuing industry as compared with what it was deriving from it before the debris decision stopped the hydraulic mouitors.

CONCERNING the project of a railroad from Los Angeles to Salt Lake, S. T. Godbe, interested in the Nevada Southeru, is reported as denying that I. S. Trumbo or J. S. Clarkson have anything to do with it, but that after southern Nevada and Utah interests are consolidated a compauy, called the Utah-Nevada Company, will be formed with a capital of $6,000,000, to hold iu trust the most valnable mining properties of that entire region, and will begin building south from Milford. President Blake of the Nevada Southeru, H. B. Claflin of New York, and J. R. DeLamar of Denver are said to be backing the scheme.

Concentrates.

THE Merrimac mine near Glenbrook is to be reopened and thoroughly developed.

THE Holcomb Valley Mining Company has incorporated in San Bernardino with $1,000,000 capital.

MEN in Metaline, Stevens Co., Wash., claim to have discovered a limitless quantity of Portland cement.

THE Yreka *Journal* says a Klamath river wing-dam claim paid $140,000 last seasou in a sixteen-months' run.

THE miners at the Robbins-Elkhorn mine, near Baker City, Or., have struck for a raise from $2.50 to $3 a day.

THE Boa mine in Timbuctoo district, Yuba county, recently bought by J. D. Redding, is to be developed this fall.

THE sale of the French Hill mines, near Plymouth, Amador county, is reported to involve a purchase price of $140,000.

THE San Francisco mint coined $300,000 standard silver dollars in August, and will increase that aggregate in work this month.

LAST Saturday the Mercur Company, Utah, declared its customary bi-monthly dividend of 12½ cents per share, or $25,000 in total.

THERE is a resumption of work in the Webber mine, at the south end of Lake Pend d'Oreille, known as the Chloride district, Idaho.

AUSTIN, Nev., is picking up, and if silver improves a little in price, or even remains stationary, the forces in the mines will be increased.

A 1000-FOOT TUNNEL is to be run on the Rusb mine, near Loomiston, Wash., to tap the vein at a depth of 500 feet, when it is intended to build a mill and turn out bullion.

THE New London property, near Plymouth, Amador Co., has been transferred. The new owners have bought the old Pacific company's machinery, which is being put in place.

THIRTY men are at work at the Rosemond copper camp between Benson and Tucson, Arizona. Some extensive ore bodies have been uncovered. A forty-ton smelter is on the ground.

THE old Carr mine and the property of the Blythe estate in Trinity county will be worked by J. G. Mather this fall and winter. The group has recently been acquired by an English company.

BODIE mining companies had cash on hand as follows on the 1st inst. Bodie, $28,898.19; Bulwer, $5124.77; Mono, $1677.51; Standard, $28,974, with $1503.21 in unsold bullion on hand; Syndicate, $901.36.

A PIONEER who has been reading of the sufferings induced by thirst in crossing the deserts, writes that he has always found relief in those arid regions by carrying a small piece of alum in his mouth.

AT Perris, Riverside Co., the Santa Fe and Santa Rosa companies are each building a stamp mill. Considerable work has been done on each mine. The Santa Rosa was formerly the property of Gov. Blasdel, of Nevada.

THE Midway, B. C. *Advance* says that owing to the duty on mining machinery the smelter for the Boundary Creek District will likely be constructed on the Colville Reservation, across the line, when that is thrown open for location.

J. B. MCLAREN, S. F. Scott, Robt. Hughes, and G. D. Mackay are trustees of the Anglo-American Gold and Platinum Hydraulic Mining Company, limited, with $250,000 capital stock in $5 shares. Principal place of business, Vancouver.

AT the Socorro placers, Bajn California, where thirty claims are being developed, a ditch is building from a stream on San Pedro Martir range. The ditch will be eight miles long. Half of it is finished, and it is expected to be completed in four months.

CRIPPLE CREEK miners are complaining of the high rates charged by the railroads for hauling ore to Denver and Pueblo. The railroad companies are earnestly advised that they are hindering the progress of the camp and consequently their prosperity.

BRITISH COLUMBIA claims to have given £10,000,000 to the world's gold output with the pan, cradle and tom. Large companies are now organizing in various parts of British Columbia's placer districts to do hydraulic work on an extensive scale.

THE Arnett Creek Gold Mining Company which is operating the Italian group of mines near Salmon City, Idaho, has recently completed the erection of a ten-stamp mill. On a trial run of sixty-five tons of ore a $900 brick was obtained. The company is well satisfied with the result.

THE Tolo Mining Company has been incorporated at Tacoma, Wash., by Wm. H. Reid, John B. Cromwell, James C. Fairchild, John L. McMurray and Peter Daley, managers of the Tacoma Smelting Works, with a capital stock of $50,000. The object is development of mining property, etc.

COUNT DES GARETS is interested in a new ore reduction process and has erected an experimental plant in Denver. "The process is a secret and originated in Russia." The Poorman Company will send 500-pound sample lots of its different character ore to Denver for treatment by this process.

THE Belle Gold Mining & Milling Company of Salt Lake City has incorporated with a capital of $1,000,000, divided into 200,000 shares, at $5 each. The company will operate the Bahy Ellen, Joe Dandy, Fanny, Rattle Snake and Splendid mining claims, situated in Osceola mining district, White Pine county, Nevada.

TWO HUNDRED men are at work at the Congress mine, Arizona. The twenty stamps on the mill are working steadily. The company is building a large lodging house for its men, which will be given them the use of free of cost. The old hoisting works are being used, and development work is continually going on.

W. A. SHAHAN, of New Whatcom, J. E. W. Macfarlane, and J. W. Campion, of Vancouver, are incorporated as the British Columbia Gold Dredging Company, capital stock $1,500,000. Principal place of business, Vancouver. Object, to engage in hydraulic mining or dredging for gold chiefly, in addition to all other departments of mining.

MANAGER CHAS. CURTIS of the Gold Hill Mining Co., at Deep Creek, Utah, is charged with appropriating bullion and amalgam worth $5000, sending it to the Mint here and spending the proceeds in riotous living. He offers to dig up some buried bullion and divide with the detectives if they'll let him go, but the inducements are not sufficient.

THE Bald Mountain Extension Company, near Downieville, has concluded not to use a boring machine, but has bought an electric plant to pump out the water and hoist gravel in the lower part of their mine, to be run by steam power. All the machinery is on the way from San Francisco and the East, and breasting will be resumed in a few weeks.

HEARING in the McBride mineral case, in which McBride claims valuable Washington school land for gold properties, assumed a sensational phase last week at Olympia, Wash., when G. W. Bloom of Tacoma, a miner employed by the State during the investigation, testified that McBride offered him an acre of land or $3,000 if he would salt the ground heavy enough to win the case.

THE Helvetia mine, at Julian, San Diego county, Cal., formerly the property of W. O. Havermale, is being worked again. Mr. Havermale, who is dead, was spending large sums of money upon it when his operations were stopped by the failure of the California National Bank three or four years ago. The mine has not been touched from that day until a few weeks ago. It is a rich property.

ON the 1st the Centennial-Eureka Mining Company of Tintic, Utah, declared dividend No. 56 of fifty cents per share, aggregating $15,000. Within a period of fifty-six months this property has paid a total of $840,000, or $28 per share. The stock is held at $34. This is one of the few properties in Utah, in fact in the West, that throughout the depression in mining circles has continued to pay regular dividends.

COL. T. B. EVERETT is getting on finely with his new machinery on the placers west of Cripple Creek. The *Journal* says the new machinery just put in operation on the placers west of town is running smoothly. Teams are employed in scraping the dirt to the machine, which absorbed as rapidly as delivered. The capacity is 200 tons a day. The value of the ground was estimated to produce fifty cents to the ton.

THE directors of the Bullion-Beck Company, Utah, have declared a dividend of 50 cents per share, equal to $50,000 in all. This was done in spite of the fact that the company is preparing to construct a new mill at its mine, which involves an expenditure of $40,000. The latter action awaits the result of the test of the Bingham lead mill on a sample of 100 tons of ore which the Bullion-Beck Company shipped last Saturday.

THE Black Butte ledge in Grant county, Or., is 88 feet wide, five feet of which is worth $240, ten feet $40, and the remainder $6 per ton; 95 per cent of which is free gold. The formation is asserted to be porphyry. At present the development consists of a cross-cut tunnel, 240 feet cutting the ledge at a depth of about 60 feet. From this cross-cut a number of drifts have been run and about 60,000 tons of ore blocked out.

W. AND J. MCKINLEY of Duluth, and J. Charnley of Chicago, have sued the Lake Superior Consolidated mines for $620,000. They charge fraud and misrepresentations were used to induce them to sell the McKinley mine to the Consolidated Company. As a result of alleged misrepresentation, the plaintiffs parted with $800,000 worth of property for stock in the Consolidated not worth over $180,000. They therefore ask for the difference.

NOW THAT American scientists are searching for some metal that is heavier than lead for the manufacture of projectiles, and yet can be thrown a greater distance, the Nevada *Herald* thinks euproscheelite may come into use. Twenty-one years ago John B. Treadwell, the well-known mining engineer, found a deposit of euproscheelite in Keru county, Cal., when it was not known that any existed in this State. Scientific men recall it now.

ADAMS, FRAKES & MANN have put in a large hydraulic plant at the junction of Silver and Ward's forks in Elliott creek district, Jackson county, Or. The ground is rich in coarse gold, pieces ranging from $5 to $15 being frequently picked up. Work has begun on the ditch to be built by Boggs & Haney on Elliott Creek. It will have a capacity of 2000 inches, and will afford water for four six-inch giants for six months in the year. The claim consists of eighty acres of rich ground.

THE mine on the summit of the Huachucas, Arizona, being worked for the glory of the Lord and the advancement of His cause, by a detachment of the Salvation Army, is turning out large quantities of good ore. This is probably the most unique mining camp and outfit in the world. The profits of the mine, after the payment of expenses, go to the treasury of the Salvation Army to aid in the great work of that organization. There are sixteen men at work at the mine, all members of the army, and religious discipline is maintained.

THE articles of incorporation of several mining companies have just been gazetted in the last number of the British Columbia *Gazette*. The Alamo Mining Company, limited, starts with a capital stock of $500,000. Chief place of business, New Denver. The Minnesota Silver Company has a capital stock of $1,000,000 in $1 shares. Chief place of business, New Denver. The Slocan Milling Company has incorporated, capital stock of $100,000, New Denver chief place of business. Object, to carry on the business of marketing, milling, concentrating and refining ores.

TIERRA DEL FUEGO, the extreme southern point of the American continent, is the latest locality in which rich gold finds are reported. It is a hard country, but said to be profitable to those there. The gold is found in the black sand washed up by the tide in the same general way as at Gold Beach, Cal., and elsewhere along the California and Oregon coast. The usual big stories that accompany alleged gold finds in far-off places are told of securing 37 pounds of gold in two weeks. That inhospitable part of the globe has long been a gold yielder. In 1853 it produced some gold, and in 1866 there was considerable interest manifested there, several thousand claims having been disposed of.

LEMHI COUNTY, Idaho, has the second largest placer mining enterprise in the United States—the Lemhi Placer Mining Company, whose property is located on Kirtley creek. This property shows from 15 to 100 feet of pay gravel, and it covers 4000 acres. The company has a ditch reaching the ground from Carmen creek, which gives a head of 350 feet. It is operating two nozzles, one of which is nine inches and the other seven inches. Under such a head, streams of this size tear away the ground at a rapid rate, but still it is estimated that it will require fifty years to wash out all that the company owns. The Carmen creek ditch does not furnish water enough to enable the company to carry on operations as extensively as it wishes, and it has therefore surveyed a second canal to be taken out of the Lemhi river, carrying the water forty miles to the scene of operations. This ditch will involve an expenditure of about $500,000.

THE *Democratic Banner* says a syndicate of capitalists has purchased all the mining property on the mother lode from Robinson's ferry to Mormon creek, a distance of some three and one-half miles. Carroll McTarnahan, the county surveyor, is now engaged in making maps and surveys of the property. This is one of the most important and largest mining deals that has ever been made in Calaveras county, and as the purchasers, among whom is Senator Wolcott of Colorado, are men of immense means, there is no doubt about them entering into extensive operations in that part of the county. The company will be known as the Montreal Mining Co. The price paid was $150,000.

THE old camp of Sanger, northeast of Baker City, Or., promises a revival of placer mine working, recent discoveries of gold deposits in gravel beds promising rich returns. Sanger, known in years agone as Hogem, has been worked for its placer deposits, and the yield in the aggregate has been enormous. Hogem, during the years from 1865 to 1867, was one of the richest placer camps in eastern Oregon. Money was plentiful and ounce diggings were not unusual. But Hogem underwent the change of all the camps. The placers were worked out and the followers of the pan and rocker moved on, other fields to explore; those who remained turned their attention to quartz mining and with fair success.

BESIDE the recent sale of the Mammoth mine for $80,000, three other mining sales are reported from Tuolumne Co. The Viertong group of four claims at Tattletown is sold to Montreal men for, it is said, $140,000. By the conditions of the sale a 40-stamp mill is to be built this year, which is to have its capacity increased to 100 stamps by the middle of '95. The Black Oak and Live Oak gold properties at Soulbysville have changed owners, the consideration being $108,000—$25,000 cash; the remainder in installments. The 10-stamp mill now there is to have 10 added, and considerable building and development work will be done. The Seminole group at Summerville is reported sold to John Coles of San Francisco for $110,000.

A RECENT rumor that the Utica mine had closed down for two months was without foundation. The mines that closed down are the Madison and Gold Cliff mines, owned by the same company that owns the Utica. Those are small mines at some distance from Angels and they were closed to save water for the Utica. The company has dams in the mountains for impounding water, but during the summer season the water began running low and it was found necessary to save it some way. Instead of shutting down, the Utica is running bigger than ever. The output is expected to be extraordinarily large during the next two months, exceeding the usual $200,000 monthly. As soon as the rains commence and there is more water for the company the two mines shut down will be started up again. At present the Angels mines are both running, the Utica and the Stickle mine.

A CORRESPONDENT of the Phœnix, Arizona, *Herald*, writing of the Yarnell mine, says: The new management attempted to do without stamps, and resorted to a chlorination plant that cost the company dearly. The chlorination sharp has taken his departure, and the mill is running on ten stamps and is fast paying up the debts. The mill is working on the Mother Lode, an adjoining property to the Yarnell. D. D. Murphy, foreman of the mine and an old California miner, soon after going to Yarnell found on examination that the large ledge of what appears to be brown sandstone carries gold. This rock lies piled up on top of the ledge. A ledge has been exposed of four feet on the Mother Lode. This claim was given Mr. Biedler by Mr. Murphy provided he would work it. It is this property that is paying up the debts of the old management and developing the adjoining properties. The ore comes out in blocks similar to that in a quarry, and is taken to the mill for about $1.10 per ton. The mill is working every twenty-four hours twenty-five tons. The ore averages $8 per ton.

THE official figures of the Branch Mint at Denver show an increase in the gold received from the Colorado mines for the month of August, 1894, over that of one year ago of 203 per cent. The increase for each month so far in 1894 over the same month of 1893 has been from 100 to 400 per cent. The gold output of Colorado in 1893 was about $7,000,000; with 100 per cent increase will make the yield for 1894, $14,000,000; with 200 per cent increase would make it $21,000,000. The gold receipts from the placers will gradually grow less as cold weather approaches, but the lode mines will increase. New and rich discoveries are daily being made in some portion of the State. A body of ten feet in width of gold ore is reported in the Old Kentucky lode, in the new Silver Lake district, near Central City; also discoveries are reported in Pine Creek, Yankee Hill and Empire districts of Gilpin and Clear Creek counties. New finds at Cripple Creek are extending the producing territory of that camp. Finds at Telluride, Goose creek, San Juan, La Plata mountains, Alma, Breckenridge and Boulder are proving the judgment and good work being used in prospecting and working the mines throughout the State.

Obituary.

DR. HERMANN LUDWIG FERDINAND VON HELMHOLTZ, the celebrated German scientist, the searcher in physics and physiology, the acknowledged Edison of the Old World and the inventor of a score of instruments which have revolutionized the surgery of the eye, died at Berlin last Saturday.

PICO PICO, the last Mexican Governor of Alta, or Upper California, died in Los Angeles last Tuesday in the 94th year of his age. He was born at the Mission San Gabriel in the first year of this century. He was Governor in 1845 and 1846, and fled to Mexico on the American occupation, returning at the time of the gold discoveries here, and resided in Los Angeles county for the last forty years.

Personal.

COL. A. J. BOWIE is in charge of the operations of the Lemhi Co.'s placer mines at Kirtley Creek, Idaho.

A. D. GASSAWAY, formerly of the Ruhy mine, Sierra Co., is superintendent of the West Harmony Gravel mine, Nevada Co., vice Jno. T. McCall, resigned.

The Gold and Silver Question.

Thomas Cornish, in the London *Mining Journal*.

After all the conferences, discussions and writiugs ahout this question, little progress to anything like a satisfactory settlemeut has heen made. It may he remembered that last year, at the July meeting of the London Chamher of Commerce, I hrought forward the following:

Resolved, That in the opinion of this meeting it is desirable a hasis of value as to the relative positions gold and silver should bear to each other should be estahlished, and that silver should bear a ratio with gold as a legal tender, and payments of indebtedness to the extent of ten per cent with gold; thus for every £100 of indebtness, hanks and other monetary institutions or iudividuals may have the option of £90 in gold and £10 in silver.

I said then, and cousider now, that this important question should he seriously considered hy gentlemen holding prominent positious in financial and commercial circles. The actiou of the Indian government in stopping the coinage of silver had already had a ruinous effect in depreciatiug the value of silver and many classes of securities.

There is a ridiculous hut current helief among the general puhlic who consider the question at all, that there is too much silver produced, and some even talk of gluts of gold that cannot he utilized, hut where are the individuals, communities or eountries that have enough of either gold or silver in coin? Have the workiug classes of this or any other country got an overahundance of money, or eveu the employers of lahor—or what are termed the capitalists? Nations and communities are complaiuiug of the scarcity of gold and silver, and all vieing with each other as to which can get the most of it. In fact, there is a general scramhle as to which nation can get hold of most coin,—that is, by coucentration from their ueighhors. Then, again, every small State—some of whom produce no gold—have the presumption to wish for a gold coinage and a gold standard. It would he interesting to know from whence they expect to get their supply. If they developed the natural resonrces of the earth they could in many places produce the gold they require, hut that would mean hard work to extract it from the matrix, and that is not agreeahle; they prefer horrowing or extracting it from other countries.

A ridiculous scare has heen created hy timid alarmists who have preached the doctrine that the world was heing flooded with too much gold and silver, hut how does that harmonize with the fact that no oue can he found who has enough of either of the metals? The mere fact that during the past ten or twelve years a greater amount of silver has heen produced than ever before in the same time, need not alarm political economists that more is heing produced than is wanted for the world's requirements. Great Britain and the Australian colonies have lately gone through a financial crisis of a severe kind, while most other countries are in a chronic state of impecuuiosity, and all for the want of more money.

The gold hlanket is not big euough to cover the financial nakeduess of all nations, therefore it is essential that silver should hear its fair share in finance with gold, and I am satisfied, after much consideration, that a ten-per-cent ratio with gold would he a henefit and convenience to all classes hy raisiug the value and uses of silver without depreciating the gold standard. Silver notes of 20s and 10s might also be issued agaiust the reserves of silver hy hanks.

Although gold and silver have heen produced in such apparently large quantities since 1849, the rapid increase of population, the gigantic extension of finance, trade, commerce and industries, and the requirements of the money-using people, have increased faster than the output of gold and silver.

The following totals show the world's production of gold aud silver from 1849 to 1889, as given hy differeut authorities:

Gold (in dollars)	$4,431,000,000	£886,200,000
Silver "	1,877,000,000	375,400,000
Totals	$6,308,000,000	£1,261,600,000

Thus, taking the production of gold aud silver during forty years of the most prolific yields the world has ever experieuced, aud the totals only amount to £1,261,600,000; now, deducting the odd £261,600,000, or about one-fifth, as heing ahout the quantity used in arts and industries, loss or wasted, would leave 1000 millions sterling in gold and silver for currency for the world's use, and taking a money-using populatiou of 1000 millions of people in the world, they would have had for division among them the magnificent sum of £1 per head in forty years, or, say, 6d per head annually of new money.

During twelve years from 1880 to 1891 the production of silver overtook and exceeded the supply of gold, the totals heing—gold, £258,865,391, and silver (at a dollar per ouuce) would amount to £311,571,819, or, say, a total of gold and silver bulliou value of £570,437,210, deducting one-fifth for use in industries, say, £114,087,442, would leave for coinage or currency, say, ahout £456,348,768, or less than 10s per head of the 1000 millions of money-using people who are all wanting more money than they have got at present, or less than 1s per head annually of the population of the world who use money.

With there facts hefore us, it is scarcely advisahle for any of the foolish alarmists to create a scare ahout an overproduction of silver or gold. There is not enough heing produced for present requirements, or to keep pace with the increasing population throughout the world who all want more money. Some alarmists are eonstantly holding up the Uuited States of America as a shockiug example of a country that has too much money, and, therefore, too prosperous, hut examine facts and see whether America is producing more gold and silver money than the rapidly increasing population and their wants require.

Take the production for 1892 in gold at ahout £6,600,000, and silver ahout £11,600,000, or a total of the precious metals at £18,200,000 sterling; deduct for use in arts and industries, say, £3,200,000, would leave for coinage or new money ahout £15,000,000 to he distributed among a populatiou of, say, prohahly over 70,000,000 people, or the insignificant sum of ahout $1 per head (in gold and silver) of the population of the United States of America.

Surely there is nothing alarming to frighten the timid political economists of the day, who profess to dread a superahundant supply of gold and silver for money in that country. It will take a long time to ruiu that great country hy producing aunually from the gold aud silver mines only one new dollar per head of its population.

The trade commerce and industries of this and other countries are uot languishing in cousequence of an overproduction, hut in consequence of not enough of gold or silver heing raised for distrihutiou in the shape of new coin currency, and if people would but hring a little more common sense intelligence to hear upou the relative values gold and silver should hear to each other, the great hughear of overproduction of silver would soon disappear.

Gold and silver, which everyhody wants more of, cau ouly be produced hy miniug, which means hard work, consequently there is no fear of an overproduction, and, therefore, mining for the precious metals is not only the most important industry of the day, hut where properly conducted is also the most profitahle, and is deserving of more attention heing given to its development.

WATER at high temperature cannot be raised any considerahle distance by suction, as the vapor discharged from the watcr so heated follows the receding pistous of the pump and resists the entrance of the water; consequently, to pump hot water always place the supply ahove the pump, so that it will he up plied from a head.

The Color of Gold.

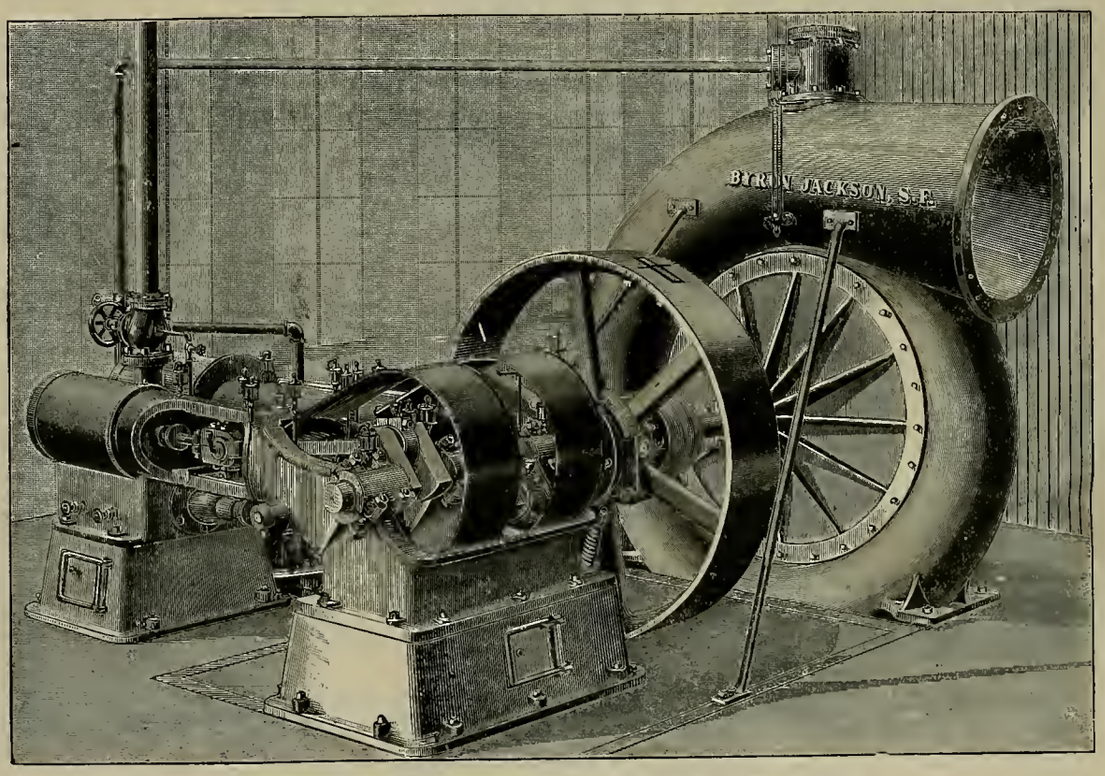
"Most people suppose," says an assayer in *Ores and Metals*, "that all gold is alike when refined, but that is not the case. An experienced man can tell at a glance from what part of the glohe a gold piecc comes, and in some cases from what part of a partieular gold district the metal was ohtained.

"The Australian gold, for instauce, is distinctly redder than the Californiau, and this difference in color is always perceptihle eveu wheu the gold is 1000 fine.

"Again, the gold ohtained from the placers is yellower than that which is taken directly from quartz. Why this should be the case is one of the mysteries of metallurgy, for the placer gold comes from the veins. The Ural gold is the reddest found anywhere.

"Few people know the real color of gold, as it is seldom seen unless heavily alloyed, which renders it redder than when pure.

"The purest coins ever made were the fifty-dollar pieces that used to he commou in California. Thcir coinage was ahandoned for two reasons—first, hecause the loss hy ahrasion was so great, and second, hecause the interior could he hored out and lead su hstituted, the difference iu weight being too small to he readily noticed in so large a piéce. Thcse octag onal coius were the most valuable ever struck."



JACKSON'S PATENT SINGLE-VALVE CROSS-COMPOUND ENGINE.

Single-Valve, Cross-Compound Engine.

The engraving on this page illustrates Jackson's patent single-valve, cross-compound engine, 100 H. P., direct connected to a 30-inch Jackson centrifugal pump, with a capacity of 20,000 gallons per minute. The pump and engine have heen found efficient and satisfactory in the work of reclaiming land along the Sacramento river and elsewhere.

ANATOMISTS, when they wish to separate the hones of a skull, sometimes resort to very peculiar procedure. They fill the skull with small heans and place it in a vessel of water. The heans swell and rend the skull apart. The well-known Germau physiologist, Grehaut, measured the force which the heans are capahle of exerting under these conditions and found that it indicated five atmospheres, equal to the average pressure in the boiler of a steam engine.

THE Indiaus of Guiana have a queer system of numeration. They count by the hand and its four fingers. Thus, wheu they reach five, instead of saying so they call it a "hand." Six is, therefore, a "hand and first finger;" seven, a "hand and second finger." Ten is "two hands;" hut twenty, instead of heing "four hands," is a "man." Forty is "two men," and thus they go ou by twenties. Forty-six is expressed as "two men, a hand and first finger."

IN 1835 the rate of wages in Europe was very low. Day lahorers in Italy received 8 cents per day, in Russia 12 cents, in Holland 18 cents, in France 30 cents, in England 40 cents, in the United States 80 cents.

The Mariposa Farmer.

An experienced miner and prospector, writing to a friend in Los Angeles from Mariposa county, gives a romantic idea of a type of the honest farmer whom we sometimes read about. He says that all the land in the region which he is in is mineral land; that it has all been taken up from the Government as agricultural land and so patented; that he made a verbal agreement with one of these farmers to be allowed to prospect the latter's domain, and if he found anything the farmer said he "could make his own terms." The miner spent weary weeks in tramping all over that big area of wild mineral land called farm, and tested many places; finally he found a lead he thought was valuable, made numerous probings on it, and concluded to "stick his peg there;" he went to the farmer to make a little agreement on the lines laid down, and was informed by the horny-handed that the latter's boys had located the lead, and that no agreement on that head was possible. The miner afterward learned that these boys of the farmer had been doggiug his footsteps all over the "farm" and locating every spot they saw him doing any work on.

The miuer further stated that the feeling between so-called farmers and miners in that country is at high pressure. The "farmers" have grabbed the land, patented it as agricultural land, while the miners insist it is mineral and claim the right to prospect on it. A few nights ago there was a "scrap" among miners and farmers, whereby oue man was killed and another wounded. There is likely to be a deluge of law suits there shortly to "bust" up a thousand or so of those frauduleutly obtained patents.

The miner draws a most depressing picture of the landed conditions in the central part of the State. With a pack animal he prospected for 300 miles between Caliente, Kern county, and the Mariposa line. All the land is taken up in immense tracts, the grauts extending far up into the mountains. These are mostly fenced in and guarded by a few farmers under the guise of cattle-herders. If you climb a fence you have some one riding up to you and demauding in broken English that you get out. The water, as well as the land, is gobbled up, and he had the utmost difficulty in getting access to enough water to quench the thirst of his burro, although streams were running at short intervals apart. He met few people on his trip, and by the few he did meet he did not hear a clear English word spoken. The land is mostly all held by men living in San Francisco and New York.

New Mexico Turquoise.

"It would be a lucky thing these panicky times if a man, while walking along in a reverie, could stump his toe against a pebble worth $4,000, and he knew the value of the stone," said James G. Wicks of New Mexico to a New York *Press* reporter, "but that is just the luck that happened to a man down in my Territory. He was prospecting for gold, and while walking along a ledge in the mountains his toe struck a little blue pebble, and he picked up the stone to look at it, when he discovered, on close examination, that it was a turquoise of rare beauty and value. It was sent to Tiffany of New York, where it was cut and polished, and it turned out to be one of the finest ever seen in America. It is worth $4,000. It is of an exquisite blue, the color of the sky on a cloudless summer day. But these discoveries are rare. Men who find pebbles worth $4,000 apiece lying around anywhere are not bruiting the fact over the country; therefore many rich finds are kept secret.

"There is no doubt in my mind that there were old turquoise mines worked by the Aztecs in New Mexico, and the Indians worked the mines later. Indian graves have been opened there in which were found a few polished turquosie beads. Eastern capitalists leased a turquoise mine a few miles from Los Cerrillos, N. M., four years ago, and several thousand stones have been produced. This $4,000 turquoise I spoke of was about the size of a blue bird's egg, but thousands of stones of the same size are found that are only of small value. Those found near Los Cerrillos are a beautiful sky-blue, but those in some other portions of the Territory are of a green color, or more of the tinge of a robin's egg. In earlier times, before white men entered the continent, the aborigines certainly worked the turquoise deposits extensively, but it is only in recent years that any commercial value has been given them."

Peculiar Engraving.

One of the experiments made by those whose business it is to test the strength of dynamite, gun cotton aud other explosives is to place fresh-plucked leaves between two sheets of panel steel and explode cartridges on the upper plate. The recoil in such cases is so great and sudden that the upper plate is driven downward with such force and rapidity as to catch exact impressions of the leaves before their delicate ribs have time to give way to the force of the blow. This novel method of engraving is one of the wonders of the country.

A Simple, Low-Priced Time Recorder.

The New National Time Recorder Company, of Milwaukee, Wis., have put on the market, in addition to the Bolte automatic and autographic recorders, their latest style recorder, which the firm has called the American. Fig. 1 shows the complete recorder,

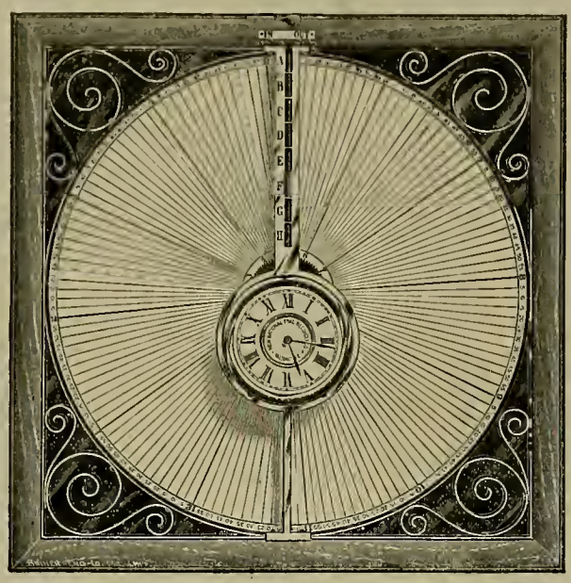


Fig. 1.—AMERICAN TIME RECORDER.

which will take a twenty-one-inch record dial. Fig. 2 shows a portion of the record dial after a day's registration has been made. The heavy lines are hour lines and the lighter ones five-minute lines. Thus it may be seen at a glance any time during the

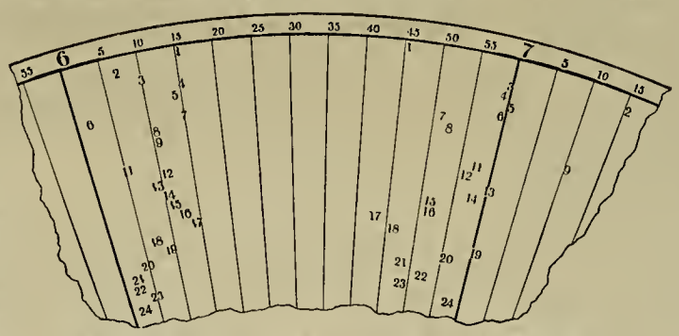


Fig. 2.—RECORD DIAL OF AMERICAN TIME RECORDER.

day, by the employer or by any one interested, that No. 2 is fifteen minutes late, No. 9 ten minutes late, and No. 10 is absent, not being registered. By a novel arrangement the numbers come consecutively on the record dial, and the key, or check (Fig. 3),

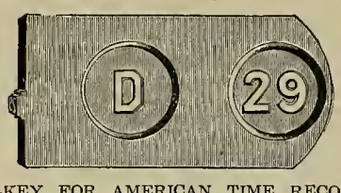


Fig. 3.—KEY FOR AMERICAN TIME RECORDER.

will enter only the hole for which it is intended. A slight pressure on the key will ring the bell and indicate that a registration has been made. The arrival of the employes is indicated by the numbers appearing in red and the departure in blue. This is accomplished by moving a small lever above the key holes, at the front of the clock, either to "in" or "out." This lever shifts the record ribbon through which the registrations are made. The recorder referred to above will register 100 employes; however, by using a number of recorders, which is generally preferable in large establishments, as many as 1000 can register, the numbers coming consecutively.

THE London *Electrical Review* believes that there are reasons for believing that the ether obeys the ordinary laws of gravitation. "If we accept the notion that ether attracts itself, and obeys the ordinary laws of gravitation in regard to itself aud to other forms of matter in a condensed form, then it is not difficult to understand its whole phenomena of disturbance."

Nitrate Beds in Colombia.

Immeuse nitrate of soda deposits have been discovered recently in the United States of Colombia, South America. As these beds are situated on or near navigable rivers, which run into the Caribbean sea, they are thus over 2500 miles nearer the markets of the United States and of Europe than the Chile fields of niter.

The new nitrate beds are about thirty square miles in extent, and are from one to ten feet in thickness. They lie at Val du Tar, south of the spurs of the Sierra Nevada de Santa Marta, a distance of sixty-five miles from the city of San Juan de la Cienaga, and are in part on the waters of the San Sebastian river, which flows into the great sea level lake of Cienaga Grande, which is the extreme northern portion of the Republic. These nitrate fields can be placed upon a direct line of inland navigation by connecting the waters of the Aracataca river with those of the San Sebastian, at a cost not exceeding $5000. When the Santa Marta seaport railway is finished, it will run to the village of Fundacion, and within half a mile of the nitrate beds.

The Heat of the Sun.

Speaking of the heat of the sun, Professor Newcomb says: "If we call the chromosphere an ocean of fire, we must remember that it is an ocean hotter than the fiercest furnace, and as deep as the Atlantic is broad. If we call its movements hurricanes, we must remember that our hurricanes blow only about 100 miles an hour, while those of the chromosphere blow as far in a single second. They are such hurricanes as, coming down upon us from the north, would in thirty seconds after they had crossed the St. Lawrence, be in the Gulf of Mexico, carrying with them the whole surface of the continent in a mass, not simply of ruin, but of glowing vapor, in which the vapors arising from the dissolutiou of the materials composing the cities of Boston, New York and Chicago would be mixed in a single indistinguishable cloud. When we speak of eruptions we call to mind Vesuvius burying the surrounding cities in lava, but the solar eruptions, thrown 50,000 miles high, would eugulf the earth and dissolve every organized being on its surface in a moment."

Making Sunlight.

Nicola Tesla, whose wonderful achievements in the line of electricity, are well known, thinks that he will soou be able to produce sunlight on the earth at will. He says that the light of the sun is the result of electrical vibrations in the 94,000,000 miles of ether which separate us from that great lumiuary, and does not proceed from a great central fire, as the scientists have all along held. If these vibrations can be reproduced the light will follow. The rapidity of the vibrations in a second necessary to produce the desired result is, he says, expressed by the figure 5 with fourteen ciphers annexed, and he is now trying to build a machine which will produce these vibrations. It would appear from what he says that this vibration must be produced in nothing, or what comes next to nothing—ether—for he asserts that if one had a solid chunk of steel as big as a house, and could communicate to it this vibration, it would instantly be atomized and disappear.

The Largest Map in the World.

The giant of the map family is now in course of preparation and construction at Washington, D. C. It was begun over twelve years ago under the supervision of the United States Geological Survey Corps, and it will not be more than half completed at the end of the present century. Some idea of the gigantic plans upon which this map is being constructed and of the magnitude of such an undertaking may be formed by considering the fact that the portion which delineates the little State of Connecticut and the northern tip of Long Island is six feet in length and nearly five feet wide. When this wonderful map is finished, it will indicate the exact location of every brook, creek, river, hillock, mountain, valley, farm, village, school house and city in the land, and will show every public and private road and highway as perfectly as the surveyor's map gives them in the townships. When completed, this map will cover almost an acre in superficial area. This beiug the case, it cannot be either hung up or spread out, and in order to make the information it contaius available, it will be issued on the sectional plan.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XIII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894 by Henry G. Hanks, F. G. S.

The pipes from gas wells sometimes become clogged with salt, which crystallizes on the inner surface. To clear this, the pressure is increased by skillful manipulation, by closing in succession the pipes of the regulator until at the proper moment they are thrown open suddenly, and the rush of gas clears the pipe very much as an animal clears the bronchial tubes by coughing. This gas is ignited at the regulator; a sudden burst of flame announces the clearing of the pipe.

Numerous devices for reducing the pressure have been invented to meet the requirements for domestic use. In dwellings it should not exceed four ounces to the square inch.

As the gas flows in the pipe line, the pressure is somewhat diminished by friction and expansion. Considerable force is required to cause the gas to flow the distance required. When it is desired to still more diminish this, the pipe is enlarged or divided. It is also reduced by valves. The flow is so regulated that when the gas has reached the end of the pipe line it has been reduced to thirty pounds to the square inch.

When flowing in the street distributing pipes, the pressure is from seven to ten pounds. It is by similar management still further reduced, so that it is delivered to dwellings at from two to four ounces, and to manufacturers at from ten to twenty ounces. The superintendent regulates the pressure from his office, which communicates with all points by telephone.

The principal gas well at Murraysville yields thirty million cubic feet of gas in twenty-four hours, but the portion used is very inconsiderable. At Findley, Ohio, one well is estimated to produce forty million feet daily. This would fill a cubic space with sides 342 feet square. This will demonstrate the utter impossibility of storing the gas.

After so many years of use and waste, during which manufacturing in the gas regions was revolutionized, as might be expected, the supply began to diminish. This was first noticed in 1877. In 1888 it was an admitted fact. The best authorities expressed the opinion that it is only a question of time, and that, while the cessation of flow will not be sudden, there is a limit to the production, and that it will eventually cease wholly. The following quotations from newspapers express the opinions of those best informed.

1891.—E. T. Jordan, natural-gas inspector for Indiana, has just returned from Findlay, Ohio, and other gas fields of northern Ohio, and reports a heavy loss of both pressure and volume of gas in all wells there. He predicts that in two years there will be no gas in northern Ohio for manufacturing. He also speaks discouragingly of the prospects in the Indiana field.

Mr. Jordan gives no scientific reason for his belief in the failure of the gas supply, but states the fact that the pressure is weakening.

1891.—SPRINGFIELD (O.), July 9.—There is a scare in the large manufacturing centers in central Ohio, which is so in the case of Springfield, Dayton and many of the smaller towns which are supplied with natural gas from the Mercer county fields. The largest company in the field has drilled in eighty-six wells at a cost of $135,000. Twenty of the wells have been exhausted and fifteen more will be abandoned within sixty days, leaving fifty-one wells on the line, and some of these not very strong. Several of the wells were tested, and it was found that the rock pressure was 240 to 275 pounds to the square inch.

When the field was first opened the pressure was from 275 to 380 pounds. An expert concludes that this pressure is too weak to force the gas as long a distance as at present, and thinks the natural-gas supply for central Ohio will soon be exhausted. Vast interests are involved.

1891.—PITTSBURG, August 3.—The Ford City Plate Glass Works, which are the largest in the United States, will return to the use of coal as fuel. The company expended a large sum of money in drilling gas wells in the vicinity of the works and thoroughly tested the question of fuel supply. Natural gas has proved to be a very uncertain thing, but the company knows that the hills about their works contain a practically inexhaustible supply of coal. This action is another proof that manufacturers are getting somewhat out o patience with the fickleness of natural gas.

1892.—The days of natural gas are numbered. There is surprising unanimity among the mining engineers on this point. They agree that more gas can be found, and that wells may continue to flow to some extent, but they say experience has proven that the supply cannot be depended on for manufacturing or for heating purposes. The amount of natural gas reached its maximum two years ago. It has fallen off each year since, notwithstanding the large number of new wells bored. Said a Pittsburg engineer:

"We have had a pretty bad time this winter in Pittsburg. The flow has given out repeatedly just at a time, perhaps, when most needed. People who had no coal in their houses have had the gas go out on them in some of the very coldest weather.

"Manufacturers who depended on gas for fuel have had to shut down. Business has been deranged, and home life has been made miserable. Some people are still boring wells and endeavoring to keep up a supply by tapping places, but with only partial success. One after another the wells give out. When they cease flowing the only thing to be done is to turn the valve and leave them alone. Sometimes a well will start up again and flow gas after it has been idle for some time. But all seem to reach a state of exhaustion sooner or later. Manufacturers are going back to coal again, and householders are agreeing that it will not do to depend upon natural gas. One thing has been made certain, the theory that the manufacture of gas is going on fast enough to supply the flow is all wrong. It is a slow process. We have already bored holes enough to overtask nature."

At Toledo, Ohio, the introduction of gas stimulated manufactures, but it is now used more economically, indicating that the supply is believed to be limited.

The supply at Bradford is gradually failing, both in quantity and pressure.

I find it stated in a paper published in 1891 that "more than four-fifths of the immense plants located in Wheeling, West Virginia, and surrounding cities have been compelled to abandon the use of gas and return to that of coal, the gas fields which supplied them being exhausted. Nearly three million dollars capital invested is practically lost."

It is thought that the decrease is due to the clogging of the well pipes and natural channels in the oil and gas bearing sands.

(To be continued.)

The Inventor of the Circular Saw.

In a lonely, secluded spot in the northwest corner of the cemetery, near the ever-beautiful little village of Richmond, Kalamazoo county, Mich., the reader can find, on a pure white marble slab nearly concealed from view by a large cluster of lilac bushes, engraved the simple inscription: "Benjamin Cummings, born 1772, died A. D. 1843." And who was Benjamin Cummings? He was the inventor of the circular saws now in use in this country and in Europe. Nearly sixty years ago, at Burtonville, New York and Amsterdam, this man hammered out at his own blacksmith's anvil, the first circular saw known to mankind. He was a noted pioneer in Richmond; a first cousin to one of the Presidents of the United States; a slave owner in New York State; a leading Mason in the days of Morgan, at whose table the very elect of the great State of New York feasted and drank freely of his choice liquors and wines; a vessel owner on the North River before the days of steamboats; a captain in the war of 1812, where, after having three horses shot from under him, with one stroke of his sword he brought his superior officer to the ground for insult, and because he was a traitor and a coward; and, after having been court-martialed, instead of being shot he was appointed colonel in his place. In this lonely grave are the ashes of the man who, nearly seventy years ago at Albany, New York, took up and moved bodily large brick buildings, and, to the wonder and astonishment of the world, constructed a mile and a half of the Erie canal through a bed of rock, and who also built, on contract, those first low bridges over the same. He also aided in the construction of the first ten miles of railroad built in the United States, and founded both the villages of Esperence and Bostonville, on the old Schoharie, near Amsterdam. The study and aim of this man's life appeared to be to do that which none other could accomplish, and, when the object sought was secured, he passed it as quietly by as he would the pebbles on the sea shore.

Work and Wages in China.

E. T. Simcox in his "Primitive Civilization" says that the two occupations in China are learning and agriculture. The standard of comfort for the laboring masses is fixed by that of the smallest cultivators, who form the largest section of the population. Poverty never involves actual starvation, except in times of famine. It means having to eat plain rice. The average man in China probably gets enough to eat, such as it is, in ordinary times. The farms are small, from half an acre to four and one-half acres. The estimate is that one acre will support twelve persons in abundance. Wages are very low. A recent Chinese writer states that the average earnings of workmen are twenty cents a day, and that half of this is enough to support a family of five, after Chinese fashion. The new Penal Code fixes the value of labor impressed into the public service at fourteen cents a day. But these are minimum rates. In cities carpenters and masons get thirty cents a day without food; servants $6 a month without food; farm hands $17.50 a year without food; clerks and accountants $10 to $30 a month without food. A soldier's pay is $5 a month without board, but half of this is paid in rice.

THE work of resurveying the boundary line between the United States and Mexico which has been going on for two and half years is about finished. Eighty men were employed under Col. J. W. Barlow. A distance of seven hundred miles—from El Paso, Texas, to San Diego, Cal., was surveyed. The changes were unimportant: the correct line is now marked, throughout, by permanent monuments.

PROFESSOR MENDENHALL'S RESIGNATION as Superintendent of the Coast and Geodetic Survey has been in President Cleveland's hands for the last sixty days, action upon it having been delayed to give Secretary Carlisle an opportunity to select a new superintendent.

TWO MEN at work on the iron ship at the Norfolk navy yard were killed by electricity recently, though there was no visible lightning flash. The ship acted as a condenser and conductor and poured the current through the men, who were standing in water.

Mines of Eastern Nevada.

The town of Ely is at the base and on the east side of the Egan range at the mouth of Robinson canyon near the head of Murray creek, a stream of clear, cold water of some 800 or 900 inches, which, besides furnishing pure water for the town through which it passes, and for the irrigation of several ranches below it, is further utilized to propel a quartz mill in the southwest part of Ely.

Nearly all the gold mines of the district, says a letter to a State exchange, are situated in Robinson canyon, about one mile west of Ely. The Chinaman mine is one of the largest and most important mines in the district. Negotiations are now pending for the sale of this property to Eastern capitalists for $150,000.

Adjoining on the north of this mine is the Joanna, with outcroppings indicating a vein 100 feet or more wide. These two mines present to the eye massive bodies of gold ore giving assays from $12 to $30 per ton, but the major portion of the gold is held impounded in iron to such a degree as to require the most careful and scientific treatment through the best and latest improved machinery and appliances to save from fifty to sixty per cent of the gold. All the gold mines of this district contain in a more or less degree the same constituents, and will require about the same treatment to relieve the gold from its impounded condition.

These two mines may be said to be literally a mountain of ore. It is a random estimate to name the amount of ore in sight, yet I will venture to say that there seems to be not less than 20,000 or 25,000 tons.

The Los Angeles mine is situated about one-fourth of a mile to the west from the Chinaman; has a shaft upon it to the depth of 75 feet, which opens out to view a large vein of fine ore which seems to be less rebellious than the Chinaman or Joanna.

The Robust is a fine prospect on the north side of the canyon, upon which a shaft has been sunk to the depth of sixty-two feet, exposing to view the entire depth a six-foot vein of gold ore assaying about $12 per ton.

The mineral formation of this district is principally lime with an occasional zone of quartzite and porphyry, also some little slate here and there. These gold deposits that surround Ely are favorably situated, and the necessary facilities for working the same are in superabundance in the shape of wood for fuel and timbering purposes, also a plenty of water. All that is necessary in addition to the above is capital to further open out these mines, aided by the hand of science. With these important factors a bright future would be assured to this district and the sprightly town of Ely, making her the business center of White Pine county.

WARD DISTRICT.—Some eighteen or twenty miles farther south on the east side of Egan range is situated Ward Mining District, noted for its large output of silver bullion from 1880 to 1888, aggregating during that period several millions of dollars. At the close of the year of 1888 the rich vein of the Martin White Company was lost by a break of the ledge or a slide of the vein in place. From that period to a few years ago a large amount of well-directed prospecting was inaugurated to re-find this rich deposit by sinking deep shafts and running tunnels, one of which was 1500 feet deep, into the bosom of the mountain. With bright prospects of encountering a body of ore in one of the tunnels, the work was closed in consequence of the heavy drop in silver.

TAYLOR MINING DISTRICT.—Directly across the Steptoe valley on the west side of Shell Creek range, ten miles from Ward, is Taylor Mining District. The population of Taylor to-day consists of one family, while three years ago it was not less than 2000 persons, and the mines and mills gave employment to over 300 men and heavy shipments of bullion were made weekly. Hotels and business houses have been left by the owners, some with their furniture still in them. Before the closing of these mines and mills a good cash market was afforded for the produce of the farms and gardens of Steptoe and Spring valleys. There is to-day some 8000 or 9000 tons of second-class ore averaging from $25 to $35 per ton, besides a large quantity of first-class ore on the dumps of the Monitor and Argus system of mines that could not be milled with profit at the present prevailing low price of silver. The two large quartz mills, which are well equipped with everything necessary, together with the hoisting works, have doubtless cost over $500,000 and are now fast disappearing. At the time of suspension of work in the Argus mine there was then in sight several hundred tons of first-class ore ready to be knocked down and worked as soon as silver shall again reach 90 cents per ounce. With a reasonable prospect that it will not drop below 80 cents per ounce, mining at this place will revive and be continued.

EVEN the likelihood of a dividend in Con. Cal. and Va. does not make buoyant the mining stock market. It has long been noted that an assessment is as likely to make a stock advance, as a dividend is to depress it, and the present state of affairs on the street is but a continuance of an existing anomaly.

A Far-Off Northern Mine.

Unique among the thousands of mining claims on this coast is the property of Mr. J. C. Greene, being the Omalik mine on Fish river in the extreme northwestern part of Alaska. The best location that can be made of the mine, which is probably the farthest north and west of any in the world, is to say that it is in Lat. 65° N., and Lon. 164° W. Juneau and Sitka seem out of the way places, but the Omalik mine is nearly as far from Sitka as Sitka is from San Francisco.

It was in '81 that Mr. Greene first acquired possession of the mine, and since then he has spent about $100,000 in developing the property, putting together buildings, steamboats, etc. He has a mine as unique as its location, being "solid metal." The ore is galena, 75 per cent of lead, carrying 143 ounces of silver to the ton and a very little gold. There is a five-foot ledge between walls of limestone and slate. Mr. Greene makes an annual visit to San Francisco, bringing the output of the mine for the year just as it was taken out of the drift, seeuring, this last trip, $140 a ton for the ore. He hires all his men in San Francisco, they agreeing to work for $75 a month and board. The mine is unique also in haviug no pay days. The men never see a cent of wages from the day they leave San Francisco till they return again with treasure in the hold under their feet from twelve to sixteeu months after. When the eargo is sold, then they are paid off, getting from $900 to $1200 apiece. As there are uo stores there is little need for money, and the mode of payment beiug fully explained to them, they have no difficulty in saving every cent coming to them and getting it "all in a lump." Supplies of all kinds are bought in San Francisco, and when the meu start for the mine enough is taken of provisions, clothing, ammunition, etc., to last a year.

Mr. Greene says it isn't louesome, "if one has enough to do to keep his mind and body occupied," and is enthusiastic in describing the magnificent forests, the waters teeming with fish, the long, cool summer days and the splendors of the aurora in the land of the midnight sun. He says where his mine is is far north of the rain belt, aud the climate in the summer is glorious, while the winter is not so cold as farther south. He thinks Alaska is the coming country, and says very few have any idea of the marvelous wealth and extent of its natural resources.

In Colorado.

Thad. Bellinger, writing to John Murphy of Wood River, Idaho, from Cripple Creek, August 25th, says:

"There are about twenty of us Wood River men here, and only three at work. It is impossible to get anything to do here unless you have the whole camp pulling for you, or you belong to the A. P. A. I cannot get a thing to do, and I've worn myself out looking for work."

Referriug to a well-known former Wood Riverite at Cripple Creek, he says:

"He is superintendent of the ——— Tunnel Company and is runniug a blind tunnel into a mountain, looking after something—all the same as the Bellevue tunnel below Broadford.

"He tries to make the impression that he has made lots of stuff. I hope he has. One thing, he has lots of company, as there are more d——d liars to the square inch in Colorado than in the balance of America."

Boiler Explosions and Their Causes.

The annual report of the chief engineer to the Engiue, Boiler and Employers' Liability Insurance Company, Manchester, England, just issued, affords an insight into the causes of engiue breakdowns and boiler explosions which cannot fail to be instructive to those who either manufacture or use steam-generating apparatus. It appears that 33% of the accidents to engines in respect of which the company paid compensation during the year were due to weakness, faulty design or bad workmanship; 27% were due to causes purely accidental or unascertained; and only 12% to the negligence of owners or attendants. The last-named percentage is considered very satisfactory, as it shows a considerable reduction on the previous year. As usual, the greater number of the accidents arose from the failure of spur gearing, and from defects in the valves and valve-gear. A large percentage of the breakdowns, however, were due to defective columns, entabletures, bed-plates and pedestals, and to the failure of screws, bolts, cotters and straps. There was a dimiuution in the number of accidents arising from the failure of the air-pump apparatus. The percentage of thorough examinations of boilers was 94, as compared with 98 in 1892. In addition to these examinations, 311 interual examinations, 407 cold-water tests and 36,255 ordinary inspections were made. These led, as might be expected, to the discovery of many defects of more or less importance. The more important may be classified as follows: Corrosion and grooving, 575; fractures and blisters, 146; safety valves dangerously overloaded or altogether inoperative, 100; water gauges out of order or inoperative, 173. Of the 994 boilers requiriug early repair, a number would undoubtedly have goue on working without repair till they exploded, or became standing examples of that perversity which appears at times to prevent boilers, as well as human beings, from doiug what they ought to do. Besides the cases mentioned above, uo less than 1020 minor defects were discovered, not dangerous, but still not to be entirely neglected. For instance, 179 safety valves were found overloaded, not dangerously, but yet overloaded.

A CORRESPONDENT of *Engineering* thus describes the means used for removing a shrunk-on crank disk from a shaft, the shaft being in place. He says: "I solved the problem by drilling a ¾-in. gas-tapping hole 8 inches up the end of the engine shaft, tapping the end of the hole, and inserting 3 feet of ¾-in. tube. Up this tube aud hole I passed a 5-ft. length of ¾-iu. tube, conuected at its outer end to a flexible water hose. A good fire under the crank disk and a plentiful stream of water up the hole in the shaft soou did all that was necessary, and the disk was removed without further trouble. The ¾-in. tube merely served to keep the water off the fire."

Best Use of Timber.

To obtain the greatest strength in timber beams, joists, rafters, etc., the *Architect* says the depth must greatly exceed the width—the greatest strength opposed to the greatest strain. A joist 6x3 will bear twice as much if put edgewise as it would if laid flat. If the weight to he supported be in proportion to the length, then, the width remaining the same, the square of the depth divided by the square of the length ought to be the same also; *i. e.*, the depth of a joist ought to be in direct proportion to the length, and for stiffness the width proportionate to the depth. Where the question is of a piece of timber supporting itself, the weight is as the length multiplied by the depth, and we must multiply this again by the length for a divisor. A rod of fir an inch square, or a plauk 10x1 laid flatwise, would keep quite straight with a bearing of five feet. A piece of timber ten inches square would swag very much with a bearing of fifty feet.

A Novel Time-Glass.

"During a trip which I took through the West Indies several years ago," said a traveler, "I saw a sight in one of the old villages which brought the old proverb, 'Necessity is the mother of invention,' forcibly to my mind. In the front of one of the houses, on a veranda, stood a sentry whose business it was to keep the time for the village by means of a primitive sand-glass. Two beer bottles were firmly tied together, mouth to mouth, and fixed iu a wooden frame made to stand in reversible positions. A quantity of black sand ran from one bottle iuto the other in just half au hour, aud when the upper bottle was empty the frame was reversed. Twelve short sticks marked with notches from oue to twelve were hung upon a string, and a hook was placed between the stick bearing the number of notches corresponding to the hour last struck and the one to be struck next. The sentry announced the time by striking the hours on a large gong."

THE following, head line and all, is clipped from the Johannesburg, S. A., *Standard and Diggers' News*, dated July 28, '94:

STARVING IN GOLDEN SOUTH AFRICA.

Is anything being done (asks the *Cape Times*) to provide shelter for the increasing number of the houseless in that city? Complaints have reached certain churches, of the cemeteries along the Green Point road—one of these cemeteries in particular—being again used by outcasts, who at night climb over the walls or creep under the old flat tombstones or on to the lee side of the upright stones, where they fall asleep. Some of these poor creatures turn up of a morning at the villas in Green Point—half starved and shivering—craving a bit of bread. The practice of sleeping in the cemetery, despite the outcry some years ago, is alleged to have become so common that some of the destitute are known to refer to certain tombstones and certain embowering trees as their own particular bed or sleeping places.

UNION IRON WORKS,

CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

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Scientific Progress.

Is It a New Gas?

Sometbing of a sensation has been created in scientific circles by the statement that a new gas, a hitherto unknown constituent of air, has been discovered by Professor Ramsay. It is said to constitute about one per cent of tbe atmosphere, to have a density about fifty per ceut greater than nitrogen, and to be rather inert and characterless. Only a quarter of a pint of tbe fluid has been isolated as yet. Professor Dewar, the chemist who succeeded in freezing air nearly two years ago, aud some other experts are skeptical on the subject. It is thougbt possible that tbe gas, instead of being an entirely new element, is simply nitrogen in another guise. Many elements and compounds known to chemistry appear in various forms; and it is suggested that we may have here ouly another instance of allotropism.

While it is too soon, of course, to accept as established this supposed discovery of a new element, the story is interesting. Even if the facts prove to be somewhat different from what Professor Ramsay believes, it must still be reckoned an advance in science when we learn to distinguish either a new substance or a new form of an old one.

The annonncement recalls a curious chapter of chemical history. Early philosophers regarded common air as an element, not a compound; and it is only a trifle over a century since the mistake was recognized. Prior to 1772 it was known that in some mysterious way breathing converted air into a suffocating substance called "fixed air," a term then used to designate carbonic acid, also obtaiued by fermentation. In the year just mentioned, however, Rutherford stated that he had found the gas expelled from tbe lungs to be separable into "fixed air" and something else; and he has therefore been credited with the discovery of nitrogen or azote, whicb forms about four-fifths of the volume of ordinary air. But it is to the discovery of another element of air that the chief interest attaches. And tbe share which Joseph Priestly had in that achievement illustrates in a striking manner how even a thoroughly scientific man will sometimes be so hampered by theory as to reject fact.

Early in the last centnry Stahl's notions as to the existence of a substance wbich, incorporated with another, rendered the latter combustible, obtained wide acceptance. Priestly became fully imbued with tbis error. He would calcine lead and mercury, and when they had turned to powder be would say, "Behold, we have burned the pblogiston out of the metal; but if we take the calx, or residue, combine it witb powdered charcoal, and heat them again, phlogiston is restored to tbe lead, or mercury, and the latter reappears in its natural or metallic form." The modern chemist knows that in the first of tbese operations there was an addition to, uot a subtraction from, the subject of tbe experiment. Instead of phlogiston being removed by combustion, oxygeu from the air entered into combination with the metal. In tbe second experiment thc oxide was reduced. Tbe oxygen abaudoned the metal and succumbed to the superior attractions of the carbon in the charcoal. Consequently the tangible product lost in weight, instead of gaiuing. Priestley's scales told him so. But instead of grasping thc true significance of that fact, he fumbled around for explanations of his failure to get the evidence he expected. Later he put what we now know as hydrogen, but which Cavendish called "inflammable air," into a bell glass, suspended over water, and there combined the gas with oxide of lead by means of a lens; and he soon obtained pure metal. Meantime the volume of gas in the receiver was reduced. Today we know that some of the hydrogen combined with thc oxygen of the calx produces a few drops of water. Priestley, though, interpreted the result as indicating tbat "inflammable air" was composed in part, or entirely, of phlogiston, which was absorbed by the calx.

Finally, in a tube containing quicksilver, immersed in a dish coutaining the same metal, he subjected calcined mercury to the heat of a burning glass. A gas was evolved which produced an exhilarating effect wheu breathed, and it stimulated the flame of a candle immersed tberein. This was in 1774, two years after Scheele's independent achievemeut at Stockbolm. Priestley called his gas "dephlogisticated air." But Lavoisier, who followed up this experiment, promptly named the new element "oxygen," and showed how completely its character and the method of its production upset the old theory of phlogiston. It was theu quickly perceived that common air—not couuting the carbonic acid, ammonia and other impurities usually found therein—was composed mainly or entirely of this substance, and Rutherford's "azote" or nitrogen. Priestley's investigations extended over a long series of years; and it was he who discovered that tbe pungent liquid called ammonia owed its peculiar properties to a gas held in solution.

The Limit Not Yet Reached.

Discussion of wbether we have reacbed the boundaries of discovery in physical and mechanical science, and whether all tbat is left to future generations is to fill in the details and supplement what has already been done seems idle, if not arrogant, when it is remembered tbat the advancement of two generations cover all tbat we call modern scientific progress, and certainly include all that belongs to the practical applications of tbe two great modern agents—steam and electricity. And yet how very crude aud wasteful continue to be the methods of producing and applying both sources of power. For iustance, what a huge proportion of thc potential energy stored up in a ton of coal is wasted in passing through a furnace, and what an infinitesimally small percentage of the electric energy generated for the production of light is actually made available.

Why should the modern applications of steam for tbe production of motion be regarded as the final expression of human ingenuity in this direction? Is there not better reason to regard them as mere tentative efforts to draw on tbe storehouses of natural energy for the use of man? It is admitted that the furnace of a steam boiler is a lame and wasteful way of doing this, but it does not follow tbat progress is to be sougbt merely in tbe direction of a better designed furnace and further advance in boiler construction. Why should it be impossible to dispense with boiler, furnace and steam together, and, in the words of a recent scientific commentator, "by some simple and practical process reduce coal to a condition in which it will, wben brought into conjunction with the inexbaustible reservoir of oxygen in the atmosphere, give us the necessary elements for the production of an electric battery?" Or why, without drawing on tbe reservoir of solar energy stored in the bowels of the eartb, not utilize the daily stream of sun-light for direct conversion into some other form of force?

These can hardly be said to lie outside the ordinary limits of buman attainments. They are in tbe direct line of the progress of physical investigation wbich is rapidly reducing the number of what are called the laws of nature by revealing the identity of its processes. We are really only beginniug to interpret nature in a comprehensive way, and applied mechanics necessarily lags behind the advance of speculative physics. But it is not at all improbable tbat tbe centnry wbich has witnessed the subjugation of steam to the service of man, with all the marvelous phases of material progress that have attended it, may also see the steam engine rauk as a discarded invention. The process began with the interposition of tbe electric dynamo betwecn the steam engine and the machinery to be moved; it takes a tremendons stride in the demonstration that power running to waste in Niagara Falls can be converted into electricity, and reconverted, two or three bundred miles from tbe primary motor, into light, beat or motion. Tbe rapidity of recent advances to its solution may be held to be a measure of the time needed to eliminate from it all the elements of uncertainty. Every electrician recognized in Tesla's discovery of the rotary magnetic field the possibility of a revolution in electrical engineering, but it required some years of mecbanical progress to perfect tbe rotary field motor, witb its enormous gain in simplicity and compactness over its predecessors. But for this tbere would be no such excellent prospect as there is for the profitable transfer over a wide area of tbe 50,000-horse power received from the turbine wheels already installed, or about to be installed, above Niagara Falls.

The first step, appareutly, to the laying aside of steam as a primary source of power is to connect with the water wbeel, which steam displaced. Thus the age of steam may come to be reckoned a mere interlude, if uot somewbat of a hindrance, in the process of scientific and mechanical evolution. For when tbe power of a cataract can be successfully transmuted into a more subtle power, capable of economical transmission over great distances, why not the power developed in the rise and fall of tbe tides? That is stopping very far short of the utilization of snnlight, and is probably enough for one generation to accomplish. But in the experiments that go to the demonstration, first, of tbe scientific, and next, of the commercial possibility of such things, there is the promise of discoveries still more advanced.

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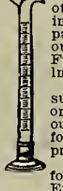

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Mechanical Progress.

Chemistry in the Foundry.

The iron foundrymen in their associations are now wrestling with the question whether or not chemistry is of any value in iron foundry work. The great majority hold that it is not, and that practical experience is the only thing that will insure good castiugs; but a few "advanced thinkers" are urging the claims of chemistry. The foundrymen are now going through the experience that the blast furnacemen went through about twenty years ago. About that time a few of them began to employ chemists, but the old timers held that the only proper way to test an iron ore or a fuel was to try it in the blast furnace. Inside of ten years every important iron works in the country had its chemist, and all the iron ore was bought on its chemical analysis. In the iron foundry, however, too much must not be expected of chemistry. It will not tell us yet what compositions of iron to use for different sizes, shapes and strengths of different castings, for the quality of a casting depends not ouly on the quality of the raw iron used to make it, but on the changes in quality that may take place in it in melting, pouring and cooling. But having once obtained castings of a desired quality, and having reached a uniform practice in molding, melting, pouring and cooling, then to insure duplication of the desired results it is necessary that the composition of the iron be the same, and this chemistry enables us to insure, giving also the further advantage that it enables us to substitute for one lot or brand of pig iron another of the same aualysis, or a cheaper mixture whose combined analysis is the same.—Cassier's Magazine for September.

American Tin Plate.

The tin plate industry is three years old in the United States. In Wales it has been pursued for centuries. When the industry was started on this side, Americans had to import British machines, British ideas and British workingmen. After three years, only a vestige of those importations remains.

The Welsh method of rolling black plate is to have two stands of rolls—one roughing, one finishing—to each mill. The most modern American practice is to have a single stand of rolls to a mill, with heavier housing, the advantages being a greatly increased product, a reduced breakage of the rolls and other parts of the mill and a somewhat better quality of the plates. The surface of the rolls is kept clean by polishing between the heats with a piece of emeried oak wood—an American device. The crude doubling shears, driven by an underground rod in the Welsh mills, difficult to repair and then requiring all the mills driven by the large engine to stop, have been succeeded by heavier shears, receiving their power from a small independent engine.

Recent practice abandons counection between hot and cold mills as in Wales, and interposes the process of pickling and annealing over the cold rolls and being rolled into the plates. Decided changes have been made in the squaring shears, the crude alligator affairs first used here giving away to vertical and more accurate shears. Improved home-made articles are being substituted for Welsh pickling machines. The claim is made that within a brief time not a Welsh machine will remain in this country.

A Device for Racetracks.

An electrically propelled couveyance, containing the essential features of the automatic cash-carrier in a shop and a trolley car, has been invented by R. E. Sherman, of Chicago, to enable judges at a racetrack to follow and watch the horses. Various schemes have been thought of for this purpose, but noue of them are satisfactory or have proved successful. Until this one is fairly tested its merits cannot be known positively; but the inventor will be allowed to erect and try his apparatus on the Hawthorne track in Chicago.

A chair wide enough to seat two persons is suspended from one overhead wire, while from another above it is derived an electric current. Under the seat is concealed a motor, the armature of which carries a wheel so belted to a second wheel as to drive a third one that supports the vehicle. There is a brake operated by the foot. Although the accounts at hand do not say so explicitly, it is probable that the current is returned over the wire used to carry the car.

MR. MAXIM has recently taken various scientific and mechanical experts out, one or two at a time, on his flying machine, to show how it works. It runs a distance of about 2000 feet on rails, and guards of timber prevent it from lifting more than a few inches from the track. A speed of thirty-seven miles an hour was developed during one of these recent tests. In another, the machine pulled loose from its guides, rose a short distance, and then fell to the earth. Other accidents have been reported, but they all teach lessons iu the art of managing the device, and nothing serious has resulted.

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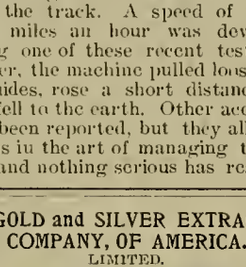

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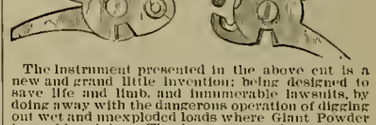

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE GWIN MINE.—The Gwin mine in Gwin canyon is in process of development. The new hoist is giving satisfaction and sinking is being pushed rapidly with three shifts. The shaft is down 130 feet. It is the intention to sink 700 feet before crosscutting the ledge. The shaft is perpendicular and has three compartments, two being 4x5 each, and a ladder way 2x5 feet. The improvements upon the surface consist of all the necessary houses and shops for the convenient and economical prosecution of the work. A good portion of the timbers and lumber they are using comes from Stockton by team, although the West Point mills are hauling some into the canyon.

Butte.

GOOD FOR FORBESTOWN.—About three months ago the splendid quartz mill owned by Alvinza Hayward and others, located near Forbestown on the Shakespeare lode, was closed down. It was said at the time that the mine had not paid expenses, but this was not verified by any person who owned an interest in the property. Forty men were thrown out of employment and that caused the people of Forbestown to feel blue, and when the Denver mill was also closed uneasiness prevailed quite generally in the camp.

Monday the Shakespeare mill was started up, and in a few days the mill will be working a full force, the prospects being very good, says the Marysville *Democrat*. It is said the Denver will also resume work in a short time, then Forbestown will again boom as it did one year ago.

Nevada.

FINE SPECIMENS. — *Transcript:* W. J. Rogers showed us to-day some beautiful quartz specimens that were taken out of the South Idaho mine. The ledge is eight inches wide, the rich streak from which the specimens were taken being about two inches thick. The prospects at the above mine are very bright.

INSPECTING THE PROPERTY.—Several of the owners of the Murchie mine are here thoroughly inspecting the property. There can be but one opinion about that mine, and that is that if thoroughly opened it would prove a paying property. When worked some years ago it gave employment to as many men as any mine in the district, and would do so again if properly worked.

WILL BUILD A DAM.—*Herald*: The Tully family are making arrangements to resume operations on the Omega mine. This old hydraulic mine was a famous "diggins" in its day, but has lain idle for a number of years by the decrees of the courts. Now the owners are preparing to build a dam to restrain the debris, so that they can mine once more.

The dam will be 62 feet high, and 192 feet long on the top, and will be built according to plans approved by the Debris Commissioners. Work will be commenced in about a week.

ANOTHER MINE.—E. A. Snider of Minneapolis, representing a wealthy syndicate of Minnesota capitalists, has bonded the Orleans Consolidated and the Contact mines, Gold Flat, and will develop them as one consolidated claim. Both are said to be good properties, and with good mauagement and solid backing a big mine may be made of them.

Mr. Snider is the gentleman who opened the Mt. Moriah mine, in Sierra county, last year.

THE EAGLE MINE.—Reports of a rich strike in the Eagle miues, five miles north of Reno, are received. They have attained a depth of 161 feet on the ledge. There were from five to nine feet of ore all the way dowu, but it was low grade. Now, at the depth of 160 feet, a rich vein of ore has been cut, samples of which assay as high as $3,000 in gold.

This is the mine which has heen supplying the reduction works with ore during the summer.

WASHINGTON MINES.—Correspondence *Herald*: The work of pushing the tunnel ahead at the Giant King Mine is rapidly progressing, and it is expected that the ledge will he struck at any moment now.

The company received about 500 feet of air-pipe this week, from Legg & Shaw of Nevada City, to place in the tunnel, but the teamsters had not got quite out of sight after unloading it when a tree that some young men were cutting on the hillside above fell and destroyed the entire lot. Superintendent Tozer has been husy ever since in an endeavor to get other pipe, as its use in the mine is imperative.

Frank Percival is having a crushing made at the Blue Jay mill of some of the ore from the ledge where he recently struck it so rich. We expect to hear of splendid returns.

At the Oak Tree Mine ten stamps have been running on the rock recently taken out, but the burning of the hoisting works has cut off the further supply for the preseut.

Running south in the mine on the 500 level, a large body of ore has been struck. The full width of it is not yet known, as no cross-cut has as yet been made. The ledge on the 800-level is also holding out well, and the appearance of the rock is very encouraging.

STRUCK IT RICH.—*Herald:* Rich ore has been struck in the Boss mine, near Sweetland. At a depth of eighty feet rock was found that assays $125 per ton.

The other locations on the same ledge are looking about as well as the Boss.

Sheriff Douglass will begiu work on bis claim, the Belle, on Monday.

Grass Valley District.

THE BELLE OF FRANCE.—On the mine known as the Belle of France, situated between the Allison Ranch and North Star, several thousand dollars have been spent in running tunnels, cross-cutting and sinking shafts on the mine, and several loads of rock have heen milled from a seven-foot ledge and also from an eight-foot ledge, which are fifteen feet apart. The seven-foot ledge yielded $5.50 per ton in free gold, and the eight-foot ledge $6.50 per ton. The sulphurets from the crushings were assayed by Pettjean of the Reduction works and went $255.55 to the ton. Three pounds of ore taken from across the ledge assayed $44.55 per ton in free gold. Forty feet to the west of these veins is still another, the outcroppings of the same heing fifty feet wide and is exposed on the surface for 1200 feet. This shows free gold and mineral, it probahly heing the main vein of the fissnre and heing a contact vein between slate and granite.

Placer.

THE HIDDEN TREASURE.—*Sentinel*: The Hidden Treasnre mine at Sunny South, Placer county, has incorporated. The business of the company will in the future be done under the name of the Hidden Treasure Mining Company.

The work of the corporation commenced July 3d. Twenty deeds to cover the transfers from the shareholders to the company were filed for record at Auhurn last Saturday.

The stock of the company amounts to 36,000 shares of the per valne of $10 per share. The shares in the Hidden Treasure are owned by Californians exclusively.

The following is a list of the officers of the new company: Harold T. Power, President and General Manager. J. A. Ferguson, Secretary. Directors—Harold T. Power, Mrs. I. M. Power, A. F. Boardman, F. Howell and R. M. Sparks.

The company have recently purchased the Dam tunnel, with tracks, water rights and dumping grounds, together with right-of-way for tailings in adjoining canons.

Several men are now at work in the tunnel. It is the intention of the company next season to erect works at the mouth of the tunnel.

The money is up and the company expect soon to acquire the Mountain Gate drift mine. The transfer deeds have nearly all heen made.

The Hidden Treasure Company now own three miles of channel, which comprises a surface area of about 2,000 acres.

By the acquisition of the Dam tunnel the company will he ahle to work their ground covered hy the hlack channel, or the same channel that is now heing worked within the lines of the Red Point.

The operations at the Hidden Treasure are the most extensive of any drift mining property in the United States.

THE MARGUERITE MINE.—*Herald:* The Marguerite mine, jnst north of Auhurn, has been producing some very good ore lately, and the company will probahly begin crushing shortly. They have ahout 200 tons of rock on the dump now, and the assays are above the average. This mine was recently the property of G. F. Deetkin, who is the preseut superintendent. The vein in this claim is adjacent to the Salsig lode which was a very rich one, and which yielded its owners thousands of dollars. The owners of the Marguerite are hopeful of developing an equally rich claim, and present indications point to its accomplishment.

Plumas.

THE REWARD MINE.—*National-Bulletin*: The owners of the Reward have a mammoth quartz vein 72 feet across. They have just finished cross-cutting it with a tunnel tapping the ledge 500 feet from the surface. The east wall is granite and the west is porphyry, the vein standing nearly perpendicular. By means of a 1,000-foot tunnel the vein can he tapped at a depth of 1,000 feet. The ore carries both gold and silver—$10 per ton, in gold, would be a very low estimate, though a yield of half that amount would make it one of the best propositions in this part of the State.

THE REDBIRD MINE.—*National-Bulletin:* This property is owned hy Messrs. Scott, Christy & Carothers, and is in Hope ravine, Mohawk valley. By means of a tunnel, the owners have just finished cross-cutting the vein, which is 38 feet wide. The strike of the ledge is from northwest and southeast, with a dip of 70 degrees. The vein matter is of a soft, decomposed nature, is about one-fourth sulphurets, and strongly copper stained. Some galena also is to be found in the quartz. The gold is scattered all through the ore, which prospects well. This large body of quartz, by means of a tunnel, can be tapped 250 feet deep.

San Bernardino.

MORE BIG NUGGETS—The desert gold camps are showing unexpected staying qualities, says the San Bernardino *Times-Index*. It was predicted that they would not last long, but that seems to be a mistake. Goler is yielding more gold now than at any time since its discovery and the yield of big nuggets, for which it is famous, still continues. George Swarthout is just in from Goler, hringing with him a nugget weighing hetween twenty-four and twenty-five ounces and worth $430. This was found in the Bensen gulch, which has heen famous for its big nuggets. It was discovered fifteen feet helow the surface and about three hundred yards from where the noted $1,000 Reed nugget was found. Mr. Swarthout reports that many nuggets worth from $20 to $150 are found in that locality, besides the usual fine placer gold.

Shasta.

THE SPANISH MINE.—*Courier*: The Spanish mine is developing into a promising mine under the energetic management of James Sallee and Wm. Chynaweth. Three eight hour shifts have heen rushing work on the mine for some time, sinking on the ledge, and the new management have knocked out the old theory that ledges in that vicinity do not hold out below water level for they are down over 40 feet helow, and the prospects are getting hetter if anything. They have run through a splendid chute of pay ore, and some time ago they shipped, loose, eight tons of unassorted rock as it came from the shaft, to the Selby Works, and the returns were flattering indeed. It is probable that a five or ten stamp mill will be erected soon at the mine. The Spanish is an old location, situated about a mile and a half from Shasta, and its development gives employment to a numher of men.

NEVADA.

Washoe District.

THE "WEST COUNTRY."—*Enterprise:* The region lying to the westward of the Comstock lode, known as the "west country," contains many large veins, as the Cole, Santa Rita, and others that show good prospects in gold at and near the surface. The only work done on the majority of the veins in this western mineral helt amounts to little more than surface scratching. The Cole, the most easterly of the west country system of veins, is the only one among them on which regular mining work has ever been done.

A surface deposit found in the Cole was worked over twenty years ago, and yielded several hundred thousand dollars. The company went down on this vein until stopped hy water, when they ran what is known as the Cole tunnel in order to drain their ground. They obtained an immense flow of water in their tunnel, and inste d of doing further work in their mine, turned their attention to supplying the town with water. The pay obtained in the Cole was in gold, and the croppings of all the veins in that direction show more or less gold.

Between the Comstock proper and the system of veins forming the mineral helt of the west country lies a rib of hard rock (usually looked upon as the footwall of the Comstock) varying in thickness from 100 to 1000 feet. This hard rock constitutes a large "horse." It is probably an immense slah of rock which at depth "wedges out." It is this big slab or rih that the West Con. Va. & Cal. Company have heen passing through. Once they get through it they will find a region of softer rock and veins of fertile quartz. Indeed, they have recently cut into a streak of quartz that assays well in gold. This shows that they are nearing, if not already into, the west country.

The veins of this west country were undouhtedly filled from the same snhterranean sonrce as the Comstock, and probably at the same time, the fissures containing the two sets of veins heing formed hy the same volcanic disturbances. The parallel veins in a mineral helt nearly always exhibit the characteristics of the principal vein of the system.

There is, therefore, no reason why the veins to the westward of the line of the main Comstock should not carry a paying amount of the same metals that are found in the eastern fissues of the mother lode.

The wonder is that this unknown west country should have been allowed to lie almost untouched foi over thirty-four years. It is probably hecause our people were fully occupied most of the time in mining the rich honanzas of the main lode. As these west veins are gold bearing—at least at and near the surface—ores of a low grade may be worked to a profit, as gold ores may readily be concentrated and all the contained sulphurets saved.

All who feel an interest in the welfare of the people of the Comstock will he glad to see that an exploring drift is at last heing pushed out into this west mineral helt at such a depth as will properly prospect the vein it contains. Besides the veins showing prominent croppings at the surface, other veins that do not crop out are liable to be found. Indeed, there are no end of possihilities in this unknown west country, and all mining men will watch with interest the exploration work now being done in it by the West Con. Virginia & California people. In that direction lies the salvation of our city.

Kennedy District.

GOLD STILL IN SIGHT.—*New Era:* The big strike in the Imperial at Kennedy continues to show an eight-foot vein of galena, and the extra rich foot of ore next the hanging wall, which gave $104 in gold, has increased to a foot and a half. Just before noon yesterday thirteen buckets of ore were hoisted, which were so nearly pure metal that it is estimated the weight of each hucketful was 750 pounds.

Hawthorne District.

Walker Lake *Bulletin:* The lessees of the Pamlico are taking out some very rich ore again, and the showing is very good.

Jack Hall and Charley Forhes are working with the dry-washer on the Box claim. They are working the surface dirt in the canyon and on the side hill, and are getting on the average about an ounce a day in gold. As this gold is worth ahout $18 per ounce, they are doing very well. Their work has demonstrated that there is room for 100 men or more to get profitable employment with dry-washers along Never Sweat gulch and the main canyon helow the Pamlico. In addition to the gold in the surface dirt, they find howlders of quartz which, when hroken with the hammer, hang together with gold. In one place they have a shaft twenty feet deep in the gravel wash which is not down to hedrock yet, and which shows pay dirt from top to bottom. In all prohability the gulch below the Central mine, the wash below the Lapanta, the Evening Star gnlch and the Mountain King gulch would all pay handsomely, if worked in this way.

RICH GOLD DISCOVERIES.—*Enterprise:* Gold-hearing veins assaying from $180 to $1000 a ton have recently been discovered in eastern Nevada on Sheep mountain, at the lower end of Pahranagat valley. There is a rnsh from Ferguson district and other points to the new strike. Even the rauchers of Pahranagat have caught the gold fever and are "mounting in hot haste" and heading their mustangs for Sheep mountain. Indeed, the big find was made hy two Pahranagat valley men. It, therefore, is a ranchers' find. This, with a hig gold discovery some distance below, at St. Thomas, and the rich mines at Ferguson and Osceola, shows that an immense gold helt exists in eastern Nevada out toward the Utah line. Nevada is fast hecoming a "Golden State.

In Ferguson district, eastern Nevada, Captain De Lamar, the millionaire mining man who has purchased several gold mines that he is preparing to work on a large scale, is sinking an artesian well eight inches in diameter. The Captain hopes to get a flow of water sufficient to run his new 100-ton chlorination mill. He is prepared to sink the well to a depth of 3000 feet unless water shall he encountered at a less depth. This enterprise will he of value to all in that part of Nevada, miners and ranchmen alike. It will he a big thing for them to have a man of almost unlimited capital come into that dry section and sink a test well, a work they were not ahle to undertake. Should the well prove a success it will lead to the putting down of many others on mines, ranches and stock ranges. The experiment is the result of getting a millionaire interested in our mines.

ARIZONA.

FROM HARQUA HALA.—Phœnix *Republican:* Everything is running along as usual in the great mining camp of Harqua Hala. The mill is running in full blast and there is gold in abundance.

Within the last week several miners have left the camp with their hard earned money, and, if reports are true, with plenty of gold taken from the mine without the knowledge of the members of the company. Some were caught with hottles of the yellow metal. Two hottles of gold were taken from the cabins of two miners. Of course nothing was said to mar the happiness of the company. This may account for the shortage of the gold output for this company has been from $10,000 to $20,000 short of Mr. Huhhard's cleanups and this company has doubled the amount of stamps at work that Huhbard and Bowers had. Of course no assets were showu.

Miners from all parts of the country are seen at Congress waiting for work in the mine. Many of these meu are old and tried hands in Arizona mines.

THE GLOBE MINES.—*Gazette*: News from Globe is that the Old Dominion Company while closing down the smelters, has not by any means stopped work on the wounderful copper mines of its group. It is understood that work for some time has been handicapped by the fact that the stopes were not extensive enough. Sixty men, comprising about all the married men on the force, have been retained and are now busily doing development work running new levels farther into the ore body and sinking the main shaft a hundred feet more.

It is understood that the company is not designing working in the near future any of the rich ores below the 350 foot level. Above this level the ores while less rich than below are of a free carbonate character, readily run through the water jacket furnaces. The deeper ores must he treated hy some other and more expensive method, by reason of their high percentage of sulphur.

It is understood that the bullion output will be resumed as soon as a sufficient amount of new ore has heen exposed to stoping in the new levels now heing run, while in the meantime the more distant ore bodies will he explored hy means of a diamond drill.

COLORADO.

GUNNISON COUNTY.—*Mining Industry and Tradesman:* The newly discovered gold fields are 12 miles from here. The general surface is hilly, hut not ahrupt, and devoid of timher except on the northern slopes, where red spruce is found. A deposit of disintegrated rock, with hut little clay covers the surface, usually to the depth of two or three feet, except in the valleys, where it is much greater, and where good grass is found. There are numerous springs, but there is no hody of water sufficiently large to furnish much water power nearer than the Cochetorpa river, some four miles distant, or the Tomichi, ten to twelve miles away.

The native rock is granite, but has been changed hy later heat to a crystalline nature, gneiss. Through this the veins have heen forced upward, and a scope of country ahout a mile wide and four miles long shows quartz hearing veins, running in a general east and west direction, through some of the veins have a southeastern and northwestern course.

The veins so far opened, show a width of from a few inches to several feet—perhaps three feet would he a fair average. The ore is generally a dark, iron-stained quartz, yet some of it is almost white. Ahout fifty claims now show free gold in the rock. Assays show values of many thousands of dollars, hut that is hut a poor test.

There are now ahout 300 men in the locality, living in tents or rude cahins, as the camp is hut a few weeks old. The men are hard at work doing the required assessments on their several claims, and there are hut one or two shafts over ten feet in depth. One is down 35 feet, and a piece of ore from the hottom showed well in gold. Some huilding is now heing done. But the miners are poor, as they proverhially are, and of themselves they can do hut little to develop their properties by deep shafts.

UTAH.

THE MERCUR MINES.—*Mercury:* The building of the Geyser mill continues to he the main topic of interest in mining circles, and it is the general impression that its completion will mark a new era of prosperity in the camp. No new developments of importance have heen reported during the week, though good reports from the mines and prospects are the rule.

Messrs. Edwards and Booth, who have a contract on the dump of the Mercur mill, have commenced the work of extracting the gold which still remains therein. A *Mercury* reporter visited the plant the first of the week

and found everything running smoothly. The plant is equipped with three iron ore tanks of a capacity of eighty tons, and from present indications the operators will be able to haul and unload them every twenty-four hours. The tanks empty from the bottom, which saves a large amount of labor in the handling of the tailings. A cleanup will not be made for some time, as it takes longer for the zinc to become loaded, of course, than when the ore first goes through the mill, carrying a much larger per cent of gold. Messrs. Edwards and Booth expect to work the tailings at a profit of from 75 cents to $1 per ton.

MONTANA

THOUSAND DOLLAR ORE. Missoula special to Butte *Miner*: Parties from Rock creek report that there is considerable excitement over some recent discoveries made in that section. Rock creek comes into the Missoula river about twenty miles east of this city. Bonita is the nearest station, on the Northern Pacific. The country has been known to contain gold for many years.

Welcome gulch, one of the tributaries of Rock creek, was rocked extensively during the early days of placer mining in Montana, but was never classed as one of the rich gulches. Welcome was worked for a number of years by Chinamen, and white men have mined in it more or less continuously of recent years with only moderate success.

The new discovery that has attracted attention recently to the district was made by two Swedes not familiar with mining. The ore is said to assay from $800 to $1000 in gold, and some very handsome specimens of gold quartz have been exhibited as coming from it. Philipsburg parties have obtained a bond on the property for $20,000, paying $1,500 down. They are working about twenty men. A number of prospectors from Philipsburg and other parts have rushed in and there are now about 200 in the camp. They are coming in at the rate of fifteen or twenty a day. A large number of locations have been made, some of which are said to be good prospects. The present indications are that there will be a big rush into the camp this fall.

IDAHO.

LOST RIVER.—The smelter for the copper company at Lost River is running successfully. Charles Clark, is general manager for this company and they intend to make a thorough test, and if successful, will put in extensive smelting works.

GENERAL NOTES FROM CHALLIS.—George L. Sheldon, superintendent of the Idaho Gold Mining Company, at Yellow Jacket has secured all of the pack-trains available to pack the 40-stamp quartz mill to the Jacket, besides the vast amount of supplies that will be necessary to run the company until spring. Three large trains have been running between Challis and Yellow Jacket constantly since early this spring, making round trips every five days, and the demand is now so great to get in machinery and supplies for winter use, for the different companies operating there, before the snowstorms set in, that it is found necessary to double the packing facilities. There are three companies at present operating at the Jacket employing about 125 men and the force is being increased as fast as arrangements can be made for them to work. The Columbia Company, owned and operated by Howe & Ellis, of Denver, Colorado, are erecting a 10-stamp quartz mill. A portion of the machinery for this mill has already been taken in, and the rest of it is in Challis awaiting shipment. When completed it will be a modern improved mill capable of treating 20 tons of free milling ore per day, and will employ quite a force of men to operate it, but at present only about 30 men are at work grading and constructing the mill. They have a good mine, and it is showing a large body of milling ore. Another enterprising company of considerable note operating there, is the Yellow Jacket Placer Company, owned by Mr. Coleman, and managed by Messrs. Pinney and Fox. This placer ground was formerly owned by Messrs. Lane, Hensely and Jones, and purchased from them last winter by Fox & Pinney, from Mr. Coleman. They have 45 men at work and are getting things in fine shape to commence mining. A double compartment 7-foot bedrock flume is nearly completed—1,100 feet of it. When completed it will be 1,500 feet when bedrock will be reached.

THE COMET MINE.—The Comet mine, on the divide between Soldier and the Smoky country, is showing very finely. Niel Shroder of Glean's Ferry is one of the heaviest owners in the property, which he has been developing for several years. The tunnel is in 300 feet, and there is seventy feet in shafts. Lately some red decomposed ore was struck and sunk on six feet, the ore showing well in assays, the lowest in thirteen running $28 in gold and four ounces in silver, while the highest went six ounces gold and twelve ounces silver. The gold is of the finest quality, running up to $21 per ounce. The vein lies between porphyry and granite, and ranges from fourteen to twenty feet wide and has a dip of about 40 deg. There is no base in this ore except iron, hence is easily milled.

FAIR ORE.—Weiser *Signal*: The 1600 pounds of ore brought out from Warrens by pack-train and shipped to Salt Lake by ex-Governor Willey, has netted him $517. He is now having a carload of second-grade ore packed out for shipment; it is being piled in Ennor Bros.' corral. This "second grade," as they call it, will mill $250 a ton.

WASHINGTON.

THE OKANOGAN COUNTRY.—*Outlook*: Three four-horse freight loads of machinery for the Bridgeport Mining & Milling Company arrived Tuesday. The big boiler and balance of the machinery will be up in a couple of days, when the work of setting up the plant will be commenced at once.

The Rush Mining & Milling Co. has decided to commence work on the big tunnel on the Rush mine, and men are surveying the site. It is a working tunnel and will tap the big vein and ore chute at a depth of 500 feet.

S. S. Collins and R. Greiger from the Slate Creek country, corroborate the stories of the rich placer strike. They brought in a sack of ore from their claims. The quartz is honeycombed and shows lots of free gold. The placer is regarded by all who have been there as the richest discovery ever made in the northwest. As an illustration, he says, a piece of decomposed quartz weighing about ten pounds was found, which, when pounded up and panned down produced $8 in gold. The gold is very coarse and nuggets weighing from 25 cents to $1.25 are not uncommon. The boys expect to make a cleanup of between $1000 and $5000 before snow flies.

Thos. Burke has returned from a trip through the Squaw Creek and Gold Creek camps on the Methow, and reports mining operations fairly active in both districts. In Squaw creek the arrastras are grinding right along and the new stamp mill will be ready for business in about a week. On Gold creek about a half a dozen placer miners are washing gravel. As yet they have not thoroughly tested the ground, but claim to get very satisfactory prospects. They are sinking a shaft to bedrock, and at the time he was there were down 30 feet. A great many of the prospectors from both of these camps have gone up to Slate creek, where an immensely rich placer discovery is reported to have been made and miners are flocking there from all directions. It is said that over 400 locations have already been made since the strike.

A GOLD BRICK.—Spokane *Spokesman-Review*: One of the largest gold bricks ever brought to this city is locked in the vaults of the Traders' National Bank. It weighs 254 ounces, and is worth about $315.50 per ounce, there being some silver in it. Its value, therefore, is not far from $83,500.

This brick is the product of the Cariboo Mine, on Rock Creek, B. C., the property of Messrs. Monaghan, King and Smith of this city, Hayden Lake and Portland. It represents a fifteen-day run on their ten-stamp mill, recently erected. The brick came to Spokane in a roundabout way via the Canadian Pacific.

Messrs. Monaghan and Smith have returned from a trip to the mine. The Little Bonanza is situated on Rock Creek, a tributary of Kettle River. To reach it there is a stage journey over mountain roads of 112 miles. The mine is now giving work to about thirty men.

On this trip Messrs. Monaghan, King and Smith bought a big placer property at the mouth of Rock Creek, fourteen miles from the Cariboo, and Mr. King remained there to push work on it. As a result of a little prospecting on the ground they brought out a vial of beautiful coarse gold. This mine is a new undertaking. It has been worked off and on since 1860, and has yielded up enormous dividends. The improvements put upon the property have cost not less than $30,000. Recently it passed into possession of Hatican, McCuaig & Cameron, and was by them sold to the present owners. A great deal of ground has never been worked at all, and after a few days prospecting on the area, the buyers concluded that the property was a bonanza yet. After the transfer had been made the former owners offered to take the mine back and forfeit an amount equal to the first cash payment.

BRITISH COLUMBIA.

GENERAL NOTES.—The Poorman stamp mill, near Nelson, has been closed for want of water.

A strike of 450 ounces in silver has been made within a mile and a half of Bear lake.

Assays as high as 277 ounces in silver have been obtained from the Boston and Winnifred claims, in White Grouse district, near Kaslo.

It is proposed by the Cariboo Mining company to stock the Cariboo for $500,000, and the Amelia for $300,000. These claims are in Camp McKinney.

The last clean-up on the Cariboo, Camp McKinney, was the result of 19 days' run, and realized between $9,000 and $10,000. The bullion went to Spokane.

All the machinery in the Silver King and Kootenay Bonanza mines, on Toad mountain was started up recently and found to work satisfactorily. The diamond drill, which is run by compressed air, made eight feet the first day, although run but a short time.

The buildings of the Noble Five group, burned in the recent bush fires, have been replaced by larger and better ones, and 17 men are engaged sacking ore. The owners are discussing whether it will be profitable to team the ore in winter time to Kaslo and sell to the Pilot Bay smelter, or to ship by the railway.

J. C. Haas has located a north extension of the Helen, in Boundary creek, called the Mystic. Assays have run from 111 to 160 ounces in silver, and $22 to $26 in gold.

A road has been surveyed from Three Forks up Carpenter creek to the mouth of Cody creek, a distance of five and one tenth miles. The average grade is five per cent, and the estimated cost $1,000 per mile.

AUSTRALIA.

THE USUAL BIG STORY.—Advices from Australia by the steamer Warrimoo, which arrived at Vancouver, B. C., on the 10th, say that another immense nugget of gold was found at Coolgardie, eclipsing the famous Londonderry find. The nugget, which has been called the Dunn nugget, after its finder, weighs 1800 ounces and is worth over $30,000. It was taken from a reef, the whole face of which glitters with gold. Tremendous excitement prevails, and since the find property has increased at the diggings 500 per cent.

The laboring miners have struck at Coolgardie and demand £4 a week. They have armed themselves with rifles to prevent outsiders working in their places. Bloodshed is feared.

Four thousand people are camped around where Dunn found his nugget.

Coast Industrial Notes.

—The Alaska salmon pack is about 600,000 cases.

—Prime wheat is selling for twenty-eight cents a bushel at Pendleton, Or.

—The Rocklia Granite Crushing Company has been incorporated. Capital stock, $10,000.

Telegraphic communication is now established between Reno, Nev. and Susanville, Cal.

Richard Gird has finished placing $300,000 worth of new machinery at his beet sugar factory at Chino, Cal.

—A Port Angeles, Wash., lumber company will furnish 3,000,000 feet of cedar for railway work in the Hawaiian islands.

G. W. Hunt has contracted to build 100 miles of road from Fort Bragg, Cal., to Mt. Vernon coal mines for the Overland Pacific Railway Company.

G. W. Strong, 10 Stevenson street, this city, has an amalgamator and settler that is claimed to be of practical value in handling gold bench sands. Its capacity is one and one-half tons.

The Portland Cable Railway, which has been in the hands of a receiver for several months, was sold at public auction on the 10th inst., for $41,718. It was bid in by F. L. Brown of San Francisco.

The Pryhiloff seal contractors killed this year about 16,000 of the 20,000 seals that the Government permits to be taken from the rookeries. Besides these, the sealers who were taking seals in the open sea killed 30,000. At this rate the seals will be exterminated.

David Patterson, master mechanic of the Union Pacific, has invented a painting machine with which he proposes to paint the hulls of ocean-going vessels at considerably less cost than the present system of hand work. He says his machine will also economically paint and sand mills and hoisting works.

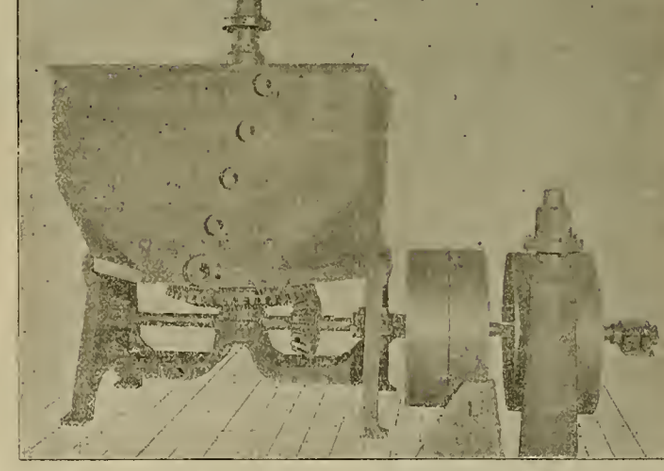
—Several citizens of Portland, Or., have formed a corporation, with a capital stock of $1,000,000 to build beet-sugar factories in Oregon. K. G. Korn, recently of Germany, who is one of the incorporators, has made an extensive chemical examination of the soil in different sections of the State with very satisfactory results.

—The magnitude of the coal deposits in the State of Washington is little realized away from the Pacific coast. Not all the Atlantic States combined contain such a supply. Workable veins are known to exist in eighteen out of the thirty-four counties, and they cover an area of more than 1,000,000 acres. The coal ranges in character from Cannel to semi-anthracite, through all grades of domestic, gas, steaming, cooking and smithing coals. With the exception of the Roslyn mines in Kittitas county, the productive measures lie west of the Cascade range. They are all lignite and bituminous. Anthracite has been found in the Olympics and in the Cascades, and there is a fine deposit at the base of Mount Rainier. These, however, have not been developed sufficiently to judge of their values. The liguite measures extend from British Columbia on the north to the Columbia river; and east from Puget Sound fifteen miles. The area covered is estimated at 800,000 acres. Less than two per cent of it is owned by companies prepared to open up veins as soon as the market is ready for the output.

—President C. P. Huntington of the Mexican International railway has ordered that the line be immediately extended from Mexico to Sierra Majado mining camp. Nearly all of the grade of this extension was completed about two years ago, but work was suspended owing to the financial depression. A branch of the road is also being built from Reata to Monterey. J. A. Robertson, general manager of the Monterey & Mexican Gulf road, is now in New York arranging for the extension of that line from Trevino to Sierra Majado and thence to Mazatlan.

—Mathew Gage, the originator of the irrigation system which bears his name, and by which several thousand acres of land in Riverside and near by are watered, has sued to recover $500,000 from the Riverside Trust Company and the Northern Counties Investment Trust of London, England. He alleges that these corporations have conspired to freeze him out of his entire interest in the great system which he had built after years of toil. In 1890 the Riverside Trust Company was organized and bought from Gage 7000 acres, together with the Gage water system, giving him in return 1700 shares of the Trust Company's stock and promising to pay him £38,000 out of its earnings. The next year Gage says that the Trust Company had a surplus of $200,000, but refused to pay his claim, and, being pushed for money to carry on his schemes, he borrowed £18,000 from the North Counties Investment Trust, giving that concern as security his stock in the Riverside Trust Company and his claim against it for £38,000. Gage alleges that the English corporation was heavily interested in the Riverside Trust Company, which is also an English company, and conspired to prevent him from realizing anything on his stock or claim. The Northern Counties Company, it is alleged, induced the Riverside Company to repudiate the statement which it made in March, 1891, that it had a surplus of $200,000, which, under the terms of the purchase, should have been used to pay off the indebtedness to Gage. The complaint also declares that the value of the stock and claim amounts to $750,000. Gage asks the court to order an accounting to declare that £38,000 is a vendor's lien on the land and water rights sold by him to the Riverside Trust Company, that the stock transferred to the Northern Counties Company he returned to him, and that he have judgment for $500,000.

Amalgamator and Settler.



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It is designed for grinding and amalgamating the ore by a rapid movement of the shoes and Muller, then change the speed to a slow movement of the same, and let in water to settle and flow out at the upper plug openings at first, and so on till all the pulp has left the pan, and the gold and silver with the quicksilver remains in the bottom of the pan to be taken out at pleasure, or after a large amount of ore has been worked.

These pans are manufactured of good material, in the best workmanlike manner, and warranted to do the work for which they are designed. They work by charge. Capacity, one and one-half tons. Weight of machine complete, four thousand five hundred pounds.

Small Laboratory Pans of fifty pounds capacity are also provided of the same pattern as the large size, for the purpose of trial tests, which are kept in constant practical use at the sampling works, **10 Stevenson Street, San Francisco, Cal.**, to determine what process is required in handling different ores.

Mining property examined, analysis of ores, plans, specifications, estimates of cost, and information as to the most profitable way of opening up and developing mines and milling ores.

G. W. STRONG, San Francisco, Cal.

Electrical Progress.

The Storage Battery.

The storage of electricity, or rather the possibility of creating and retaining a potential difference within a glass or metallic vessel, first evinced itself in the discovery of the Leyden jar, which occurred in 1745.

Ritter and Gautherot, in 1801, demonstrated the principle of electrical storage by immersing two plates of the same metal in acid, and having subjected them to the action of an electric current in one direction, connected the plates to a galvanometer and observed the production of a secondary current in au opposite direction.

In 1842 Grove constructed a gas battery, on the principle that the oxidation of the copper anode in an electrolytic cell produces electrical storage, which consisted of a three-necked flask, containing acidulated water, into which was inserted two tuhes containing respectively oxygen and hydrogen. Platinum wires sealed into the upper ends of these tubes were connected with platinum electrodes in contact with the gases ahove and the water helow; thus the external circuit was completed through copper conducters whose terminals dipped into mercury cups. When the circuit was closed the gases recombined to form water, thus generating an electric current, which in the cell flowed from hydrogen to oxygen and externally from oxygen to hydrogen, and whose E. M. F. was equal to that required to electrolyze water, so that the storage of electrical energy hy chemical decomposition was recovered hy chemical recomposition.

In 1859 Gaston Plant's discovery of the special adaptation of lead plates for this purpose opened the way for the practical use of electrical storage. Plant constructed a cell using as electrodes two large sheets of lead rolled together and electrically insulated from each other hy strips of gutta-percha. They were then immersed in acidulated water, in a tall glass jar, and subjected to the action of a hattery current supplied hy two or more cells. The chemical reaction which followed resulted in creating a difference of potential between the terminals which manifested itself in the discharge of the cell.

The tedious and expensive process requisite for the electrical formation of Plant's plates led to the invention of Camille A. Faure, ahout 1880, of plates prepared hy covering sheet lead with a paste made of red lead and sulphuric acid, the coating heing confined to the surface hy a covering of paper and hy felt placed hetween the plates, which also served the purpose of insulation. Thus prepared and rolled together, they were placed in a glass jar with acidulated water, and the coating suhjected to electrolysis, and with alternation of current was, in a few days, changed to a spongy lead of different chemical composition than at first, the cell then heing ready for practical use.

While the Faure cell could he produced much more economically than the Plant, and was equal to it in electrical energy, it had such serious defects that its utility was circumvented. The felt preventing the free circulation of the current, and seriously impeding electrolysis, it soon became corroded by the acid and partly removed in patches, and ceased to insulate. The coating failed to adhere properly, sloughed off and fell to the bottom. Hence, in a short time, the cell proved worthless. But its invention serving to direct the attention of men like Brush, Swan and Sellon to his field, resulted in the inventions of many greatly improved storage hatteries.

The storage battery of to-day, though not perfect, has nevertheless rendered much valuahle service. Its applications are varied, and while not as yet very extensive, they are sufficient to indicate that storage hatteries may, in the near future occupy a very important place in the electrical industries. A fortune awaits the lucky man who invents a storage hattery that will overcome all the ohjections to those in common use; and can confine electricity in considerable quantities within a small vessel, which will ever he ready to do man's hidding.

Storage Battery Impossibilities.

Occasionally we read, says the *Electrical World*, in newspapers, predictions of the possihilities of the coming storage battery, and some enthusiasts have even prophesied that when "perfected," ocean steamers will he propelled hy this popularly misunderstood apparatus. While, of course, every one with au iota of electrical knowledge recognizes the ahsurdity of such a claim, yet au illustration of how absurd it is may be of interest, and to furnish this we will apply the necessary calculations to the case of the new Cunarder Campania. The hest transatlantic time of which we have a record made by this ship, whose displacement is 18,000 tons, was 5 days 12 hours and 15 minutes, during which the average speed was 21 knots, corresponding to ahout 26,000 average horse power and a consumption of coal for the trip of ahout 2,700 tons. Assuming storage hatteries of fifty pounds to the hourly horse power, the entire weight of hatteries to do the same work, and allowing for no reserve, would he 76,750 tons of 2,240 pounds, or more than four times the entire displacement of the ship. To determine the weight per horse power that a storage hattery should have to compete with steam in the case under consideration, we will assume that the eutire weight of the hoilers aud machinery of the Campania is 3,750 tons, which is prohahly near the actual weight. Adding the coal consumption for a trip, 2,700 tons, we have 6,450 tons as the entire weight of the electrical plant. Assuming the weight of the electrical propelling machinery to he 1,500 tous, we have finally for the total weight of the hattery 4,950 tons. With these data we find that the weight of a hattery, allowing for no reserve, would have to be 3.16 pounds per hourly horse power. How small this is can he appreciated from the fact that a 150 ampere-hour cell would weigh on this hasis only about one and a quarter pounds, really about the weight of its lugs. A similar calculation would show the impossihility of storage hatteries displacing locomotives, yet the writer knows of a company formed several years ago which spent several thousand dollars in attempting to perfect a battery for such a use. Much of the misconception in regard to the power of the storage hattery must hc ascrihed to the sensational manner in which it was introduced to the puhlic hy a very great scientist, his statement in regard to holding "one million foot pounds of energy" in his hand not yet having lost its effect. The great value of the storage hattery in its proper field, which is of vast extent, and as yet scarcely entered in this country, should be sufficient to satisfy its most sanguine friends. Only harm can come from making claims heyond its power to fulfill, and much harm in this way has heen done, aside from the ahsurd instances we have here considered.

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In Southern California, a 20-stamp Gold Quartz Mill, with engine, hoiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could he conveniently removed. Can he had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Franoisco.

Gold Quartz Mine For Sale.

A Good Quartz Mine, near Scott Bar, Siskiyou county, is offered for sale. Parties wishing to invest in quartz-mining property will do well to examine this ledge, from the extension of which ten-dollar rock is now heing crushed. The average width of the ledge is two feet. For further information, call on or address W. A. CHAMBERLAIN, Yreka, California.

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Practical Information.

Extraordinary Degrees of Cold.

It is a well-known fact that the zero point of the thermometer—*i. e.*, the temperature at which ice melts in our atmosphere—is only considered to be arbitrary in scientific circles. The temperature *above* zero is probably unlimited. However, it appears certain that at a temperature of about 6000° of heat the component parts of our earth would liquefy and evaporate, whereas at a temperature of 273° below zero everything would freeze and chemical activities would cease. This unknown degree of cold has been somewhat closely approached by R. Pictet by means of a very peculiar method. He employed various freezing mixtures, one after the other, the temperatures of which grew lower and lower; and at the same time he conserved the cold in special apparatus, termed "cold cells or wells," and thus obtained the desired result.

The liquid medium used by Pictet in the first "cold cell" was of his own invention, and consisted of liquid carbonic acid and sulphuric ether. With this he obtained a temperature of 110° below zero. He plunged a condenser into these first cold cells, in which the vapors of the highly volatile nitrogen monoxide were deposited; by this means he created a fall in the temperature to 150° below zero, and thus obtained the second "cold cell." In this cell condensation of nitrogen gas, atmospheric air, etc., took place at a high pressure. At this time the temperature fell 210° below zero. These experiments have paved the way for the production and employment of absolutely enormous pressures. The temperatures were measured with hydrogen thermometers which were graduated by comparison with sulphuric ether thermometers. Pictet had the satisfaction of seeing atmospheric air in his apparatus in the guise of an azure-colored liquid. With a temperature ranging between 100° and 150° he was able to obtain a sound from solid quicksilver and to study alcohol, ether and chloroform in the solid condition.

A Familiar Optical Illusion.

It is well known that the sun appears much larger when setting than when it is at a considerable elevation in the sky. This fact is commonly ascribed to the greater facility of comparison, in the former case, between the dimensions of the solar disc and those of terrestrial objects on the horizon. Professor S. P. Thompson suggests that the effect is in some considerable part due to the greater redness of the sun, viewed through an atmospheric screen of much increased thickness. Red is, of course, an "advancing" color, while the more refrangible rays "retire." It might be supposed that a simple experiment with a blue glass screen would discover what share the mere altered color of the sun's disc has in producing the effect above noted. But the brightness of the image is another factor which it may be necessary to take into account, and by which the effect sought might be masked in this experiment. A red glass screen interposed between the sun and the eye at midday would be a better test of the theory.

THE early astronomers were all astrologers, and claimed to be able to predict the future career of various individuals by "casting horoscopes," showing the movements of the planets at the time of their birth. The position and movements of the various celestial bodies were not only supposed to control the destinies of men, but were also thought to bring weal or woe, tempest or sunshine, upon the earth itself. A man born when the sun was in the constellation of Scorpio was believed to be naturally bent toward excessive indulgence of the animal passions. One born when the sun was in Pisces was predestined to grovel or be a servant, while one whose earthly career was opened when the great luminary was in Aries would be a great scholar and a man known to the world despite all opposing influences.

THE great 3,000,000-candle power search light, the largest in the world, which was built especially for the Columbian Exposition and which played such an important part at the Midwinter Fair, has found a final resting place in southern California. The light has been purchased by Prof. J. B. C. Lowe, the builder of the great cable incline railway, and will in future flash its rays over the San Gabriel valley from the summit of Echo mountain.

Free Electricity.

According to a New York man, there are a number of places in the city of Brooklyn where electricity may be had free of charge by simply connecting wires between water mains and gas pipes where they enter buildings. Along the lines of the trolley railways in Brooklyn there is a very extensive discharge of electricity into the ground, and these currents find their way to the water pipes and gas pipes. It is said that in some cases electricity enough to run fans and sewing machines, to the extent of over one-horse power, can be had; it is stated that the gas pipe in almost any house near the trolley lines will give seven amperes and 300 volts, sufficient to run seven sixteen-candle lights. Such a current would do very much better than this. One of the experts said: "If you drive a couple of gas pipes to the return leg under the railroad track, you can get sufficient power to run heavy machinery." As this power seems to be running to waste in the ground, says the *Scientific American*, there appears to be no satisfactory reason why it should not be made use of free of charge by any one who has the good fortune to live along the line of the trolley railway. It is different from secretly tapping water pipes or gas mains. This electricity is running in the ground; it has been discharged or thrown away by the railroad company, which, consequently, can have no claim upon it.

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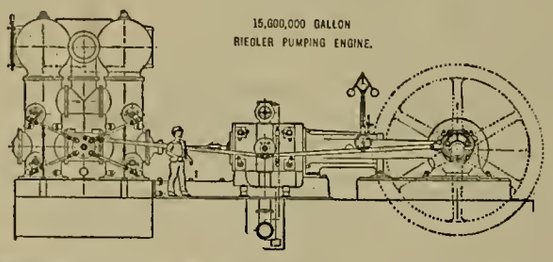

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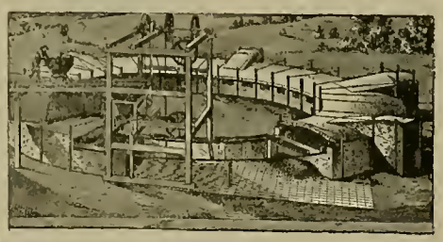

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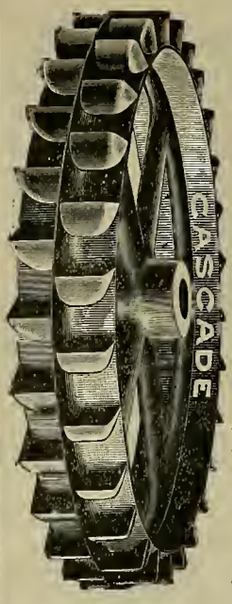

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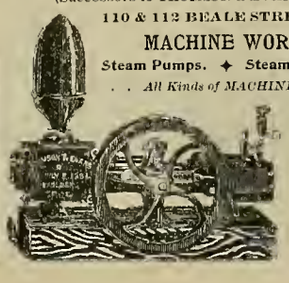

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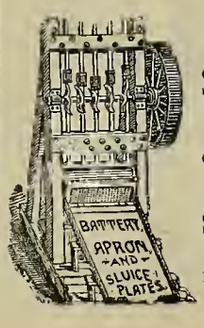

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Market Reports.

The Markets.

SAN FRANCISCO, Sept. 13, 1894.

The New York price of lead dropped to $3.05 during the week, the lowest notch, so far. The new tariff takes off one cent a pound duty, and Mexico can send in its output now under what amounts, practically, to free couditions. Utah is still seething over the manipulations of the Lead Trust. W. F. James, the president of the Ore Producers Association of Salt Lake, tells the *Tribune* that one series of prices sent out hy the trust was for wholesale purchasers, the other for retail. By a rule of the Metal Exchange any quantity of lead sold under twenty-five tons was a retail quantity, and established no market price. Lots of twenty-five tons and over were wholesale, and determined the market price. Of course the metal market manipulator must have been a party to the fraud, either wittingly or unwittingly. As much as 500 tons of lead have been sold in one day to one buyer, and all in lots of less than twenty-five tons, and for prices from $4 to $8 per ton ahove the price telegraphed on that day as the market price which the producer had settled upon. And as the Lead Trust and combine controls all the lead iu the United States they would not offer as large a lot of lead as twety-five tons for sale in a single lot.

When there was no huyer on the market except themselves, they would huy it in, thus fixing the price of lead to buy at where they wanted it; and wren purchasers appeared they would supply them with what they wanted in small lots, at advanced prices; but under the rule of the Metal Exchange these prices could not be sent out, as they were selling prices for small lots under 25 tons. Utah, be thinks, is not strong enough to buck against the combine alone.

In conclusion Mr. James says: "Tbe ore producers have advised with good lawyers in Salt Lake City, as well as in several Eastern cities, and I say to all concerned that if tbe lead-ore producers of the intermountain country were fully advised of the wrong being done them and would combine in a determined fight for tbeir rights, they would not only correct this outrage hut remedy others equally as had. Until they do so they will have to submit to a continuation of impositions."

"In the end," Mr. James added as an afterthought, "I suppose the only permauent solution of the problem lies in the capital of the West uniting and establishing its own smelters and handling all its own ore."

The little advance in silver was but temporary. During August it reached 66⅛, which was the highest siuce January of this year. The lowest price was on the 5th of last March —58¾. It is thought that the oriental war and other causes will keep it up to at least the preseut quotatiou for some time to come.

During August there was shipped from San Fraucisco to Hongkong 461,713 Mexican dollars and 4500 sols of Peru; to Shanghai $244,300 in silver hars, and to New York $112,600 in American silver coin.

New York Prices.

NEW YORK, Sept. 13.--Followiug are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	29⅞	64⅝	....	....	....
Friday	29⅞	64⅝	9 15	3 05	19 40
Saturday	29⅞	64⅞	9 12½	3 05	....
Monday	29¾	64⅜	....	....	....
Tuesday	29⅝	64	9 15	3 05	19 40
Wednesday	29¾	64⅛	....	....	....

The local hulliou, money and exchauge quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86½
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	64⅝
Mexican Dollars, nominal	54

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	12
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	15 00	@	16 00
LEAD.			
Pig	—	@	4½
Bar	—	@	4¾
Sheet	—	@	5⅞
Pipe	—	@	5
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 55
Drop, B and *larger* sizes, " "			1 75
Buck, Balls and Chilled, do. " "			1 85
QUICKSILVER.			
Home trade, per flask	35	87½@	36 00
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	21	@	22
ZINC.			
Sheet	8½@		9
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 75
Coos Bay			5 50
Cannel			8 00
Egg, hard			10 00
Wallsend			7 00
Scotch Splint			7 00
Brymbo			7 50
West Hartley			8 25
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Splint	7 00	@	— —
Cardiff	6 75	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Sept. 13, 1894.

Last week's stock market closed strong, comparatively, and held its own in the early part of this week. Consolidated Virgina, Ophir and Curry were in demand.

On the Comstock now, as noted elsewhere, the general movement is to the "west country." The Con. Va. is pushing westward on the 1100-foot level; the Gould & Curry, the Union Consolidated, Sierra Nevada and Ophir are also exploring western ground.

In the Bodie the battery assays for the week were $101.36 per ton. There is some talk of a dividend there.

The following illustrates the changes of the week:

Mines.	6	13
	$	$
Alpha	....	....
Alta Consolidated	....	15
Andes	55	58
Belcher	83	79
Best & Belcher	1 35	1 35
Bodie	1 50	1 60
Bullion	32	30
Challenge	37	....
Chollar	20	44
Confidence	1 00	....
Consolidated California and Virginia	4 25	4 30
Consolidated New York	....	....
Crown Point	71	77
Exchequer	....	10
Gould & Curry	72	74
Hale & Norcross	....	68
Justice	33	26
Mexican	1 20	1 30
Ophir	2 30	2 70
Overman	22	22
Potosi	65	70
Savage	65	65
Sierra Nevada	1 05	1 15
Union	71	74
Utah	....	8
Yellow Jacket	72	72

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 13, 1894.

FIRST SESSION—9:30 A. M.

600 Alta	15	300 Mexican	1 30
100 Andes	58	200 Ophir	2 65
350 Belcher	79	300	2 70
200 Bodie	1 60	100 Overmau	22
400	1 55	100 Potosi	70
150 Bullion	30	200 Savage	65
700 Bulwer	18	800	66
100 Chollar	44	600	67
450 Con Cal & Va	4 30	100 Sierra Nevada	1 15
50	4 25	100 Uniou	74
200 Crown Point	77	100 Utah	08
100 Justice	26	100 Yellow Jacket	72

SECOND SESSION—2:30 P. M.

100 Andes	57	300 Exchequer	10
200 Belcher	72	300 Gould & Curry	74
300 Best & Belcher	1 35	100 Hale & Norcross	68
30	1 40	230 Mexican	1 30
200 Bodie	1 55	50 Mono	30
300 Bullion	30	100 Ophir	2 70
150 Bulwer	19	100 Scorpion	05
100 C. C. & Va	4 25	100 Silver Hill	04
235	4 20	100 Union	72
200 Crown Point	75		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 4, 1894.

525,523—TRACTILE DEVICE—C. M. Allen, S. F.
525,587—FILING BLOCK—E. A. Brush, Hydesville, Cal.
525,532—ROTARY MOTOR—A. Clement, S. F.
525,535—VALVE DRAIN CUP—W. K. Conness, Sacramento, Cal.
525,649—TELEGRAPH CALL—W. H. Garven, Portland, Or.
525,496—CASTER—S. Hamm, S. F.
525,545—BUGGY TOP REST—J. Heilrath, Sacramento, Cal.
525,497—FUMIGATOR—H. Hoffman, Byron, Cal.
525,549—CAR COUPLING—J. C. Hurley, Fairhaven, Wash.
525,461—STOVEPIPE SHELF—C. N. Johnson, S. F.
525,501—BOX MAKING VISE—Knauer & Tyler, Sacramento, Cal.
525,347—SHIPS—L. M. Lincoln, Sacramento, Cal.
525,505—CAR BRAKE—Murray & Allen, S. F.
525,618—WAGON BRAKE—B. F. Pascoe, Globe, A. T.
525,361—POTATO DIGGER—G. W. Phipps, Lockeford, Cal.
525,625—SEAMING MACHINE—H. Schaake, S. F.
525,473—GRINDING MILL—J. J. Seeman, Garden Grove, Cal.
525,521—CAN SOLDERING MACHINE—C. M. Symonds, S. F.
525,522—HOSE COUPLING—Williams & Seely, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

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ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12,	Oct 17, Nov 7	J E Jacobus, 309 Montgomery
Bay State M & D Co, Cal	22	3c	Aug 25,	Sept 29, Oct 24	F E Luty, 330 Pine
Brunswick Con G M Co, Cal	7	2c	Aug 22,	Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7,	Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	30c	Aug 9,	Sept 13, Oct 4	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	74	15c	July 27,	Aug 30, Sept 21	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	37	5c	July 17,	Aug 24, Sept 21	C C Harvey, 309 Montgomery
Ophir S M Co, Nev	63	25c	Sept 5,	Oct 9, Oct 29	E B Holmes, 309 Montgomery
Potosi M Co, Nev	42	25c	Aug 2,	Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Teirakoff C G M Co, Cal	12	2c	July 24,	Aug 24, Sept 20	W J Gurnett, 308 Pine
Savage M Co, Nev	84	30c	July 27,	Aug 30, Sept 19	E B Holmes, 309 Montgomery
Silver King M Co, Arizona	11	30c	July 31,	Sept 11, Oct 2	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2	Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Gray Eagle M Co, Nev	C C Harvey, 309 Montgomery	Sept 19
Mono G M Co, Nev	M E Willis, 309 Montgomery	Sept 20

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

COMBINED SHOE AND GLOVE BUTTONER.—Ida E. Mushette, Oakland, Cal. No. 525,154. Dated August 28, 1894. This device is made of two oppositely projecting buttoners of about equal length; they are fitted to slide upon each other, so that when slid inwardly their outer or working euds are overlapped and protected, and when moved outwardly their hooks are fully exposed and a double-ended buttoner is formed. Thus a single article is provided, combining a hook for buttouing a shoe and a hook for buttoning a glove. The device is compact and neat in form and appearauce; it can be carried in any pocket with entire protection for and from both hooks, and it can be readily exteuded for use.

SULKY CULTIVATOR. — Richard V. Dorsey, assignor to Jensen & Lauritzen, all of Watsonville, Cal. No. 525,096. Aug. 28, 1894. This invention relates to improvements iu that class of machines known as "sulky cultivators," in wbich the cultivator frame is made to rise and fall with reference to the wheels and pole of the machiue. to raise it out of the ground or depress it into the ground. It consists of a wheel axle immovably fixed to the rear of the pole having upwardly projecting lugs or standards near its opposite euds, bell crank levers having the angles fulcrumed to the standards, with one arm projecting rearwardly and the other upwardly, a single bell crank lever fulcrumed in the slot of the pole, with one arm projecting forward and the other downwardly, connecting rods extending from the upwardly projecting arms of each of the first named levers to the downwardly projecting arm of the lever fulcrumed to the pole, links connecting the rear arms of each of the first named levers with the rear portion of the cultivator frame, and a frout arm of the pole lever with the front end of said frame and hand lever wherehy the mechanism is acted to raise aud depress the cultivator. The hand lever is held in place by a segmental rack.

SQUIRREL EXTERMINATOR.—No. 525,127. Aug. 28, 1894. Thomas R. Barney, San Francisco. This invention relates to an apparatus which is especially adapted for the destruction of squirrels, gophers and other burrowing and small vermin. It consists of a chauber or pan designed to hold a combustible or other substauce to produce noxious or suffocating fumes, means for placing the apparatus far into the iuterior of the hole or hurrow, aud supplying an air blast tberetо. This means consists of a chamber having upturned sides and front by which it may he pushed into the hole and a tubular flexible metal haudle which will bend and follow the sinuosities of the hole, one end of this haudle being counected with the rear of the chamber so that it serves to push the chamher into the hole, and a blast apparatus connected with the opposite end of the tubular handle to supply air for combustion and force fumes into underground passages.

FRUIT BASKET AND CRATE. — No. 525,112. Aug. 28, 1894. R. E. Morey, San Francisco. The object of this inveution is to provide a novel meaus for transporting small and perishable fruits. It consists of a basket composed of thin veneers of wood crossing each other at right angles haviug upturned sides, rectaugular strips of wood dovetailed together at the meeting angles to serve as a rim, witb staples fastening the corners, and wire staples wherehy the upper ends of the veneers are fastened to the insides of the rim so that the latter projects around the top of a basket in the form of a ledge hy which to lift the basket. In conjunction with this basket is a crate having vertical walls, with channels or ribs upon which the projecting rims of the haskets are supported so that the baskets are suspended from their upper edges and the hottom and sides are left free from contact, and this allows a perfect circulatiou of air and relief from all pressure which would damage the fruit.

SAFETY ATTACHMENTS FOR GAS BURNERS—No. 524,801. August 21, 1894. Henry Eschweiler, San Francisco. The object of this invention is to provide an attachment for gas burners which will operate automatically to stop the flow of gas if the cock be accideutally opened or the gas extinguished while it is open. It consists of a pillar and burner tip, a pipe by which gas is supplied thereto, a controlling cock, an interposed chamber through which the gas flows, a projectiou from the bottom of the pillar haviug an opening in one side for the admissiou of gas tbrough it to the tip, a two-part liquid containing receptacle horizontally pivoted so as to rotate within the chamher, an eccentric pin projecting from the plug of the cock adapted to form contact with either of the two sides of this receptacle so as to turn one side uppermost when the cock is closed and the other part uppermost when it is opened, whereby the liquid will flow from the uppermost to the lowermost chamber through a small couuecting passage, and a valve is fixed to the part which is uppermost wheu the cock is opeued, in such a position that when the weight of the liquid has been transferred to the other side, the receptacle will he turned aud the valve will close the opening to the burner. This insures the cutting off of the gas supply wbenever tbe weighted receptacle is rotated about its pivots. An expansion bar is fixed in the pillar which is acted upou by the heat when the gas is lighted, and a bent wire haviug one end fixed iu the bottom of the pillar passes over the upper end of this expansiou har, thence downwardly into the chamber below, and has an outwardly turned point which presses against the valve on the rotary receptacle so as to keep it open and allow the gas to euter as long as the expansion bar is elougated by the heat of the gas. If the gas is extinguished the bar will contract and will thus allow the end of the bent wire to draw inwardly and this relieves the valve so that it will close and prevent any more escape of gas.

FILTER.—No. 524,821. Ausust 21, 1894. Herman Eisner, San Francisco, Cal. This invention relates to certain improvements in filters. It consists of a compartmeut filter case baving chambers for the reception of unfiltered water, means for delivering thereto and regulating the supply, with dovices through which the water is passed and filtered, and a reservoir to receive and contain the filtered water after passing the filters, a means by which the unfiltered water chamber aud the surfaces of the filters may be periodically cleaned of any deposit within and upou them. The filtered and unfiltered water chambers are disposed one above the other, with openings made between them and filters removably fixed in the openings. These filters consist of cylindrical chambers having wire, gauze and hair-cloth disks fixed therein, and an interposed packing of pulverized charcoal. The supply pipe has a valve which is controlled by a float in the unfiltered water chamber, so that the rise and fall of the water in this chamber actuates the valve and regulates the supply. A jet tube is so arranged with relation to the disks that when the supply valve is opened a jet of water will be discharged across the surface of the disks to clean them of any deposit which may have lodged upon them.

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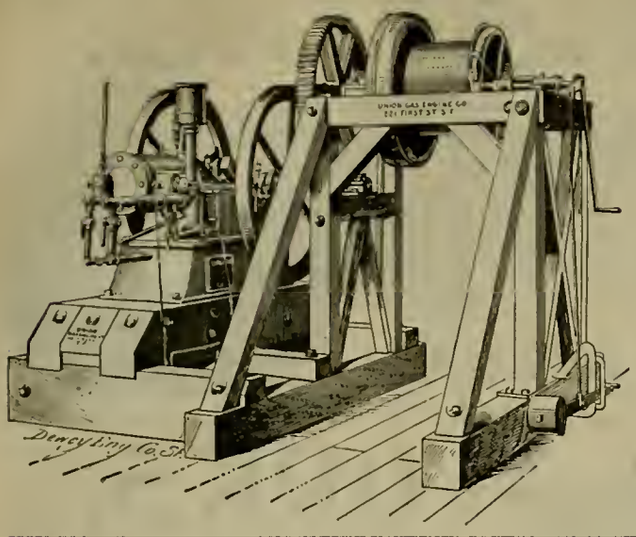

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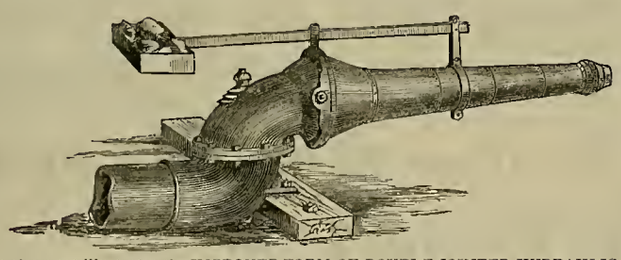

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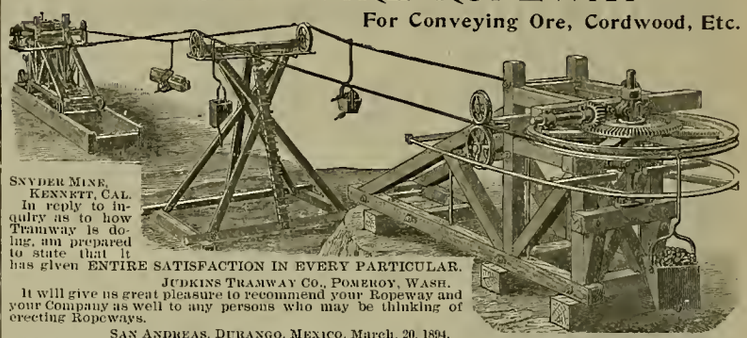

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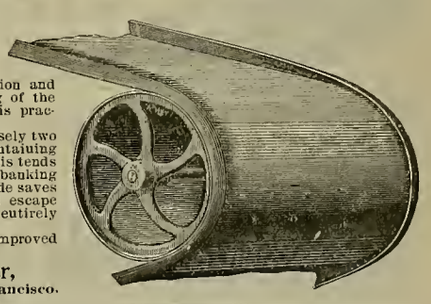

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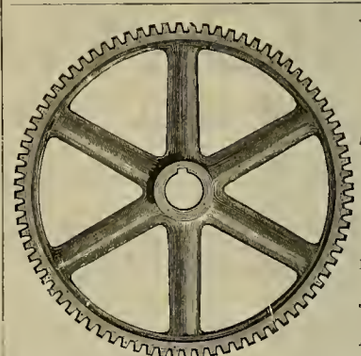

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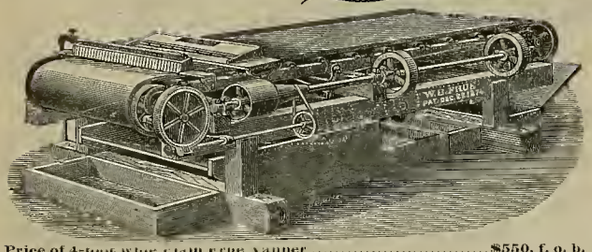

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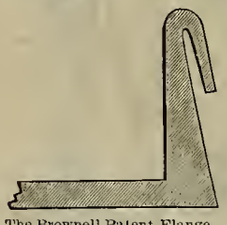
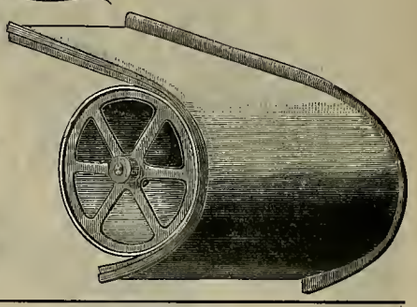


The Brownell Patent Flange.



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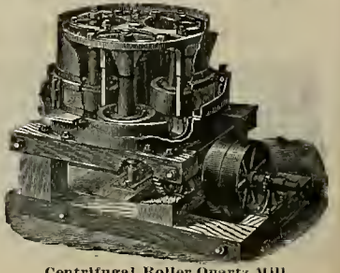

Centrifugal Roller Quartz Mill.

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 12. SAN FRANCISCO, SATURDAY, SEPTEMBER 22, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

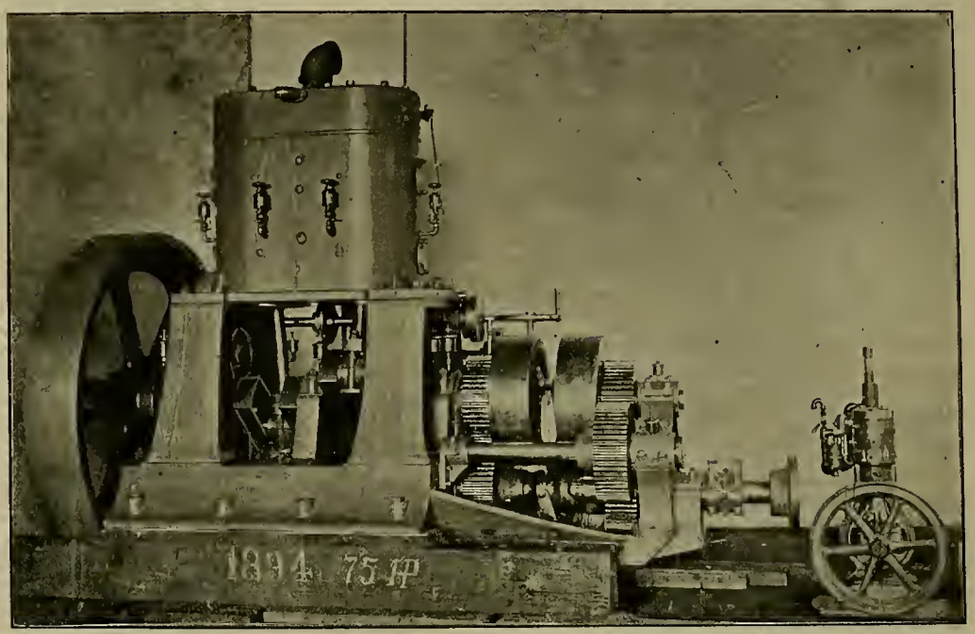
"San Francisco Leading the World."

We take particular pleasure in calling the attention of our readers to the large marine gasoline engine on this page. This engine is claimed by the Union Gas Engine Company, builders, to be the largest marine gasoline engine in the world. It was built on the order of Mr. J. S. Kimball, and is being placed in the schooner "Moro" now lying on the stocks at Alameda point.

The schooner will be launched in three weeks and a trial trip will occur immediately thereafter. The illustration shows the rapid and enormous growth of the gasoline engine in the last few years, the small engine at the right side of the picture being of the type of 1890 and of one H. P. The largest marine engine heretofore built by this company was a 40 H. P., which has been doing good work for nearly a year on board the schooner "Bessie K.," also owned by Mr. Kimball and associates. Of course it goes without saying that it was the satisfactory work performed by the 40 H. P. engine which led to the order for the one of 75 H. P.

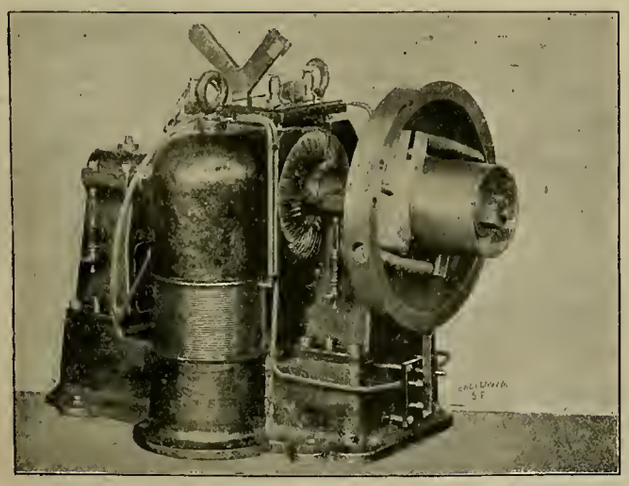
We will not attempt in this article to go into a technical description of the engine, but will say that it weighs about ten tons, stands nine feet high, and will be placed in the schooner just abaft the main mast. The reversing gear is so arranged that in less than three seconds the propeller can be reversed from full speed ahead to full speed astern. There are some twelve or fifteen new mechanical arrangements and devices on this engine, all of which will be patented at once.

San Francisco is the home of the gasoline engine, and it is here that its greatest and most rapid growth has been obtained, but the success which is following the business here has led to the establishment in the East of several large manufacturing concerns, one of which, the Globe Gas Engine Co. of Philadelphia, is building from the Union Gas Engine Co.'s plans and patterns, and under its patents.



LARGE MARINE GAS ENGINE RECENTLY BUILT BY THE UNION GAS ENGINE COMPANY.

HEREWITH is illustrated the latest type of long distance constant current electric motor, manufactured by the Electrical Engineering Co. of this city. There are about fifty of these machines in constant use in the city, engaged in such work as was formerly done by steam and gas engines.



LONG DISTANCE CONSTANT CURRENT ELECTRIC MOTOR.

"NEW PROCESSES" are daily reported from various mining localities, some of them, doubtless, of merit, but only valuable by the showing of results and satisfactory experience. The absurd claims made occasionally by inventors and projectors should not detract from the value of novel or improved processes, but the only measure of judgment is success, and success can only be assured by economical showing in practical results.

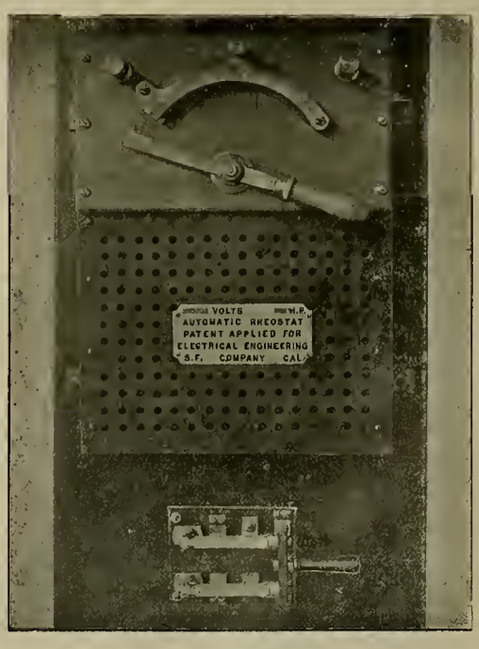
IT is satirically suggested that in view of the increasing output of gold that the yellow metal may be in danger of demonetization. It is not, however, deemed probable that the market value of gold will be greatly affected nor that platinum will be given the preference for coinage purposes for some time yet.

THERE is considerable activity in the sale of gold mine property in the vicinity of Baker City, Or., several cash transactions being reported from there at prices ranging from $5,000 to $50,000. That district seems to be a present favorite with Chicago men, who prefer gold mines to railroad stock as a paying investment.

THE standard silver dollar will celebrate its Centennial on the 15th of next month, the first lot of U. S. silver dollars—1758 in number—having been issued on October 15, 1794. Many millions have been minted since then, and it would have been better for the country every way if more millions had been issued in the last twenty-one years—since the demonetization of silver in '73.

IT has been said of bumble bees that they are biggest when they are born. It is to be hoped that the same cannot truthfully be said of the Gold Horn Mining Company which recently organized in Los Angeles; capital stock, $300,000; amount subscribed, $5.

THE accompanying cut represents the new type of patented rheostat, manufactured and used by the Electrical Engineering Co. of this city in its long distance high potential mining plants. The device is made entirely of non-combustible material, is strong and rigid in every part, and of a very superior quality of workmanship; but the most interesting feature of the device is its means of controlling the electric current so as to protect both itself and the motor operated on the circuit which it controls.



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San Francisco, September 22, 1894.

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DESPITE indignant protests it has been determined to return the Apache Indians captured with Geronimo to Arizona. Geronimo himself will remain in Alabama, where he is a justice of the peace and a deacon in the church.

THE National Bureau of Steam Engineering, Navy Department, Washington, D. C., has just received a report from Chief Engineer Wilson, looking after the work of the Engineers' Department on board the battleship Oregon, on the contractors' trial of that vessel, held recently. According to the report, the machinery developed 9500 horse power, and the maximum speed obtained was seventeen and a half knots. This is over two knots above her contract speed, which is a good showing for the Union Iron Works. The completion of this fine vessel is contingent upon the arrival of the armor plate, which is a matter of government delay.

ELSEWHERE is printed the official report of the committees in charge of the mining exhibit at the Midwinter Fair. It is a matter of congratulation to the miners and mining interests of the State that the exhibit was a success in every way. The exhibit was large, varied and fairly representative of all sections of the State. It was seen by hundreds of thousands of people, and aided in no small degree in the renewed interest everywhere manifested in California's mines. It was well managed, and now the gentlemen in charge are able to show a receipted bill for every expense incurred, and a cash balance on hand of $1500, which has been turned over to the California Miners' Association.

Of Practical Value.

"The Gas and Petroleum Yielding Formations of the Central Valley of California" is the title of Bulletin No. 3, issued by State Mineralogist Crawford. It contains about 100 pages of practical information on California hydrocarbons, prepared by W. L. Watts, M. E., the result of personal research and observation, and is illustrative of the value of the State Mining Bureau.

It is a compendium of up-to-date information regarding the gas and oil yielding formations in the Sacramento and San Joaquin valleys and the adjacent foothills. The geology and topography of the several districts, the present stage of development, descriptions of the work now being done and suggestions relative thereto are given, supplemented by chemical analyses. In view of the present interest in this portion of California's mineral wealth, the issue of this pamphlet is most valuable and timely. It contains maps and illustrations, and will be furnished free of charge to any one applying for it personally or by letter to the State Mining Bureau, Pioneer Building, San Francisco.

An Australian Mine Report.

Among the many home and foreign mining companies' reports received, that of the Sunlight Gold Mining Co., of West Hillgrove, N. S. W., is noticeable by reason of its minute detail. Every item of expenditure is so elaborately set forth, and the expense account is so subdivided that the precise cost of every movement is shown.

The report, which is for the six months ending June 30, '94, shows that during that period 8237 tons ore had been treated, yielding 3386 ounces gold, worth £11,875, an average of £1 8s 10d per ton. The cost was £1 3s per ton. It is the published minutiæ of this cost account that is noticable. There are ten divisions, which embrace 24 subdivisions, which include 91 separate sources of expenses. The elaborate system of accounts shows that in getting out the ore 5s 8d per ton was paid to miners, 11d to truckers, 6¼d to mullockers, 8¾d to timbermen, 5¼d to drill sharpeners, 5¼d to shift bosses. It cost 8.946d per ton for blasting materials, 4½d per ton for candles, one-tenth of a penny for tallow, 3¾d for timbering, 1½d for tools, three-fourths of a penny for drill steel; nails, screws, rivets and dog spikes, combined, cost one-third of a penny; bar, angle and sheet iron, and shear and square steel cost 1¾d; coal and charcoal cost 1.7d. Separate accounts are kept with every department of development work. In the "tramway" department, for every ton of ore the engine driver got 2¾d, the fireman 1d, the brakeman 2¾d, the hopperman 2¾d, the lander 1¾d. For each ton of ore there was paid for fuel 1¼d, water 1.04d, oil .3 of 1d, packing .12 of 1d, tar .13 of 1d. The fractions are here condensed: in the report from which we quote every little detail is carried out to three decimal places. For instance, in the account marked "Battery" comes the division "Labor," subdivided as follows, the figures in all cases being the cost per ton of the ore extracted, expressed in pence: Engine drivers, 5.917; stone breakers, 5.480; feeders, 6.974; blanket boys, 4.952; amalgamators, 4.769; tailings dam cleaners, 0.778. The "Battery" account is still further subdivided as follows—"Supplies:" Firewood, 18.040; grease, oils, waste and packing, 1.876; lighting materials, 1.021; pump leathers and valves, 0.259; belts and laces, 0.132; stamper heads, 0.433; stamper cams, 0.204; stamper shoes, 2.141; stamper dies, 0.480; screens, 0.933; baize (blanketing), 0.778; quicksilver, 1.773; chemicals, etc., 0.126; shovels and tools, 0.199; spur and pinion wheels, 1.413.

The more minute and intricate subdivisions of the above are omitted.

Several pages of these extraordinary details are given. It is interesting to observe that while for every ton mined 8s 10½d were paid to the miners, but 3 pence were paid for office salaries; and that the "law expenses" were less than one-half of one penny per ton. "Rent and royalty" cost over 3 shillings per ton; while, on the other hand, "telegrams and postage" cost less than one-eighth of a penny for every ton of ore, and the "carriage of bullion" but 1¾d. Row after row of the most elaborately prepared tables appear, making it evident that if office salaries only aggregated 3d per ton, skilled accountants can be secured for very low wages in the vicinity of West Hillgrove.

The report closes with a page proposition and argument on the part of the directors notifying the employes that even still closer figuring would be required to make matters satisfactory to the home office, and that a sliding scale of wages would be at once put in force, based on a daily yield of 55 tons of "stone," and that each one would be paid so much or so little per ton of output. The usual array of thousands of figures follow on the next page showing that on that basis the daily earnings of the men would run from 5s 4d to 7s 6d.

If every department of business in Australia is as closely figured in all its multifarious details as the mining industry, the owners will have little trouble in determining where the leak, if any, exists.

THE annual convention of the California State Miners' Association for 1894 will begin its sessions in this city on Monday, November 19th. Matters of mutual importance to the mining interests of the State are pending, and it is in order that representative delegations appear from every part of the State.

Another Bonanza.

If half what is asserted is true, Nevada has a new bonanza in the discovery of gold quartz "that will assay $80,000 to the ton." The strike was made by Messrs. Zirn and Schulz at Pine Nut, near Carson. The Carson *Tribune* says:

This wonderful strike will no doubt attract mining men and capitalists to Pine Nut from all sections of the coast, as it is proof that a gold deposit of mammoth proportions exists at Pine Nut. The strike means renewed life for Carson and all western Nevada. It makes everybody feel good, and already property in Carson has gone up twenty-five per cent.

At a depth of seventy-five feet Zirn is reported to have run into an ore body that appears to be half gold. In two hours he took out $600 in fine gold. The *Enterprise* says:

The vein where the fabulous gold was found is the westerly of three veins which are clearly defined by croppings. Two of these veins have already been opened up, namely the eastern and the western veins. A shaft has also been sunk on a stringer of the middle vein, which resulted in finding ore assaying $10. The westerly vein, upon which the Zirn-Schulz claim is located, has already been shown to have a length of 6000 feet. The loose surface dirt, in a little gully 200 feet south from the spot where the Zirn-Schulz gold is located, pans about $30 at the point where the gully crosses the vein and gradually depreciates in value, going, 200 feet below, about $15. The rich vein is decomposed brown iron and quartz containing entirely free gold, with occasionally small quantities of native silver.

A large proportion of the Comstock ore gave 46 per cent of its value in gold. Should this new bonanza have the dimensions claimed, it would exceed the old one in richness. It would be a fitting sequence were the State so greatly depressed by the demonetization of its chief mineral product to be able, like Colorado, to produce the yellow metal in such quantities as to make up for the depreciation in silver, and, by increasing the world's stock of gold, aid in dispelling the disparity that at present exists.

Oil at Los Angeles.

Los Angeles is fast adopting crude petroleum for fuel, which there aids in solving the coal problem. It sells at $1.25 a barrel, a reduction of nearly 50 per cent, and it is expected to go lower. It is now proposed to establish a refinery. Oil is ordinarily found at an average depth of 300 feet; at the depth of 600 feet a better stratum of shale is reached, and sanguine Los Angelenos expect to shortly show natural gas within the city limits.

At the last meeting of the mining committee of the Los Angeles Chamber of Commerce the following was passed:

Whereas, A great and increasing interest is being manifested in the petroleum and other mineral development of this portion of the State, and we learn that the State Mineralogical Bureau, through its agent in the field, has investigated and reported upon the oil and gas-bearing formation upon the eastern slopes of the Coast Range, thus imparting very valuable information to the great assistance of capitalists and investors, and consequent increase in production; and

Whereas, It appears very desirable that similar investigation should be made, particularly of the oil and gas-bearing formation on this side of the Coast Range, with direct reference to this locality and the immediate vicinity of Los Angeles, for the reason that larger investments have been made upon this side of the Coast Range in the minerals referred to, which should certainly entitle us to due consideration; therefore, be it

Resolved, That this Chamber present this whole matter to the attention of the State Mineralogical Bureau of San Francisco, with a request that such action be taken by it in the near future, including active investigations in the field, as shall constitute a proper presentation of the whole subject, with maps, charts and such other aids as are necessary to define the mineral belts and give a clear conception of the whole subject.

AT the recent Populist Convention in Pueblo, Col., one of the speakers, discoursing upon finance, is reported to have said:

I have been at Creede, and looking down the shafts of the dark mines, I am more than ever in favor of the issuance of greenbacks by the Government. Men should be released from delving in the ground.

The statement that this remark "was greeted with deafening applause" would indicate that that convention was not an advocate of any kind of metal money. Just why looking down a dark shaft should so strongly impress that particular delegate with the superiority of a greenback issue is not quite clear. Even with advocates of rag money, however, the time has not yet come when men will be released from the ancient and honorable occupation of "delving in the ground."

THIS week the Alaska-Mexican Gold Mining Co. sent down a $20,300 shipment, the result of crushing 6434 tons ore—an average of $3.16 per ton. The fact that such low-grade ore can be worked at a profit illustrates the advance in mechanical appliances. It must also be added that the circumstances and surrouudings of that mine, like its neighbor—the Alaska-Treadwell—are peculiarly conducive to economical working.

Concentrates.

THE Oroville *Register* says the Shakespeare mine at Forbestown is still idle.

THE *Era* reports resumption of work at the Mt. Hope mine, Forbestown, Cal.

ACCORDING to the *Journal*, Cripple Creek, Col., will produce $1,000,000 in gold this month.

SAN FRANCISCO men have bought the Solano mine, Nevada Co., and will put on machinery.

THE gold at the new Pine Nut, Nev., discoveries assays $18.85 per ounce at the Carson mint.

A CONCENTRATOR is being placed at the Shenandoah mine, Plumas Co., and the mill started up.

A DIVIDEND of twenty cents per share will be paid by the Homestake Mining Co., next Tuesday.

THE total mineral product of the Black Hills from 1881 to 1893 inclusive is $42,845,277, nearly all gold.

THE Jackson Mining Company, Eureka district, Nev., paid a five-cent per share dividend last Wednesday.

EASTERN men will build a 20-stamp mill on the Ohio and Oro-fiamme mines in Hassayampa district, Arizona.

THE Virtue mine, Baker City, Or., has shipped a $16,000 gold brick, the result of one month's run, to this city.

IT is said that $100,000 has been refused for the Lost Horse mine, north of Indio, Cal. This mine was located last January.

THE Lincoln mill, at Silver City, Idaho, has started up. It has ten stamps, which are expected to crush thirty tons per day.

RICHARD WILLOUGHBY has sold his mine on Admiralty island, near Juneau, Alaska, for $100,000, to San Francisco men.

THE Osborn mine at Websterville, Placer Co., has been sold at administrator's sale to O. L. Barton, of Rocklin, for $10,500.

A CURIOUS fact about the ore from the Slocan country is that the higher the percentage of lead the higher the cost per ton for treatment.

THE Nogales, Arizona, *Vidette* asserts that the gilt-edged accounts of Thomasville, Pinal county, are not in accordance with the facts.

THE Gold Mining and Milling Company has been organized in this city. Capital stock, $1,000,000, of which $525,000 has been subscribed.

THE *Eagle* says: More gold has been shipped to the United States mints from northern Grant county (Or.) this year than for many years.

THE Beckwith mine on Rock creek, sixteen miles from Baker City, Or., has been sold to Messrs. Coruth & McMillan, of Texas, for $30,000, cash.

EXCELLENT reports are received from the Eagle mine near Reno, Nev. At a depth of 160 feet, the ore vein gives samples that assay $3000 in gold.

EX-GOVERNOR BLAISDELL of Nevada has bought the Bigelow mine, Sierra Co., which paid so well two years ago under the lease of the Morrison Bros.

ONE HUNDRED men are employed at the Gold Bank mill and mine at Forbestown, Cal. An eight-foot tunnel will be driven 1000 feet lower down the hill.

GEORGE J. GOODHUE, of the Kootenay Hydraulic Co., has received $60,000 for the use of his company and will use it in putting in a pumping plant.

THERE was a general resumption of active operations this week at the E & E mine, at Cracker Creek, Or. A furnace has been built for roasting the ores.

ABOUT 200 men are employed in the quartz mines in and around Sierra City, and the prospect is very favorable before long of a considerable increase in this working force.

GOLD SAVING MACHINES are being successfully operated on the north fork of the John Day river, Grant county, Or. Good hard times wages are being made by the miners.

PROMINENT Utah Mormons have formed "the Utah Co.," with $10,000,000 capital, and intend, among other things, to extend the Salt Lake & Los Angeles road to the coast.

"SHALL the State capital be changed from Helena to Anaconda" is the question now agitating Montana, and replied to by most of the Montana press to hand in the affirmative.

THE Bartlett process is pronounced a success in handling the low-grade gold ores of the Cripple Creek, Col., district. It is credited with saving ninety-two per cent of the assay value.

CAPTAIN MOORE'S 100-ton concentrator at Silver Creek, B. C., will be in operation this fall. It is the first works of the kind erected in the Slocan, and the machinery was admitted free of duty.

THE Bodie on the 10th inst. shipped $24,600.37—the straining and blanket cleaning of twelve days' run. The *Miner* thinks if the stock was selling at its full value, it would be quoted at $20 and over.

FOR its exhibition at the Midwinter Fair Nevada county contributed $2,378.25. The committee have filed their final report, turning over $259.50, which has been placed in the county treasury.

A CLEANUP at the Osborn Hill mine, Grass Valley, on the 18th, showed a return of $7280 for a twelve-days' run of the 20-stamp mill, 10 stamps dropping on first-grade and 10 on second-grade ore.

IN the Alma district, Park county, Col., a single ten-stamp mill has produced $20,000 in gold during the past year. The supply of ore has not been regular, owing to want of system in working the mines.

OWING to the cheapness of Mexican silver, remarks an exchange, as compared to bullion, more than one man is remarking that it might be worth while now to buy up Mexican silver and hold it for a raise.

THE Kiagman, Arizona, *Miner* hears that Bucky O'Neill has sold his group of Big Bug onyx mines to New York capitalists for $250,000. If so, "Bucky" ought to be able to make political pots boil lively in the Territory.

THE Robbins-Elkhorn mine, Baker City, Or., reports a cleanup of $2535, the result of an eighteen-days' run. Three carloads of concentrates were shipped to the Everett Smelting Works last Saturday.

IT MAY be a little harsh in statement, but there is a mighty truth in the command of the Anaconda *Standard*: "Do one of two things, every man who reads this page—have faith in Montana or quit the State!"

THE Morning Star mine at Iowa Hill is being supplied with a new dynamo that will furnish lights of twenty-candle power. This will make the second one in place, as they already have one with ten-candle power for lighting the mine.

DURING July, 57,500 ounces gold were recovered from tailings in the Transvaal, a decrease of 500 ounces from the returns of the preceding month. The aggregate from that source for the seven months ending July 31st is 388,950 ounces.

AT the Gold Bronze mine, Vanderbilt, Cal., there are twenty-five men at work. A vein of eighteen inches to two feet in width has been uncovered, furnishing ore that yields all the way from $10 to $100 a ton. Sinking continues on the main shaft.

THE Lamarque Mining Company has incorporated at Grass Valley. There are 100,000 shares of the par value of $1. The incorporators are S. C. Thompson, A. Maltman, E. L. Foster, J. A. McClure and James F. Paul. The *Union* says machinery will be put in right away.

THERE was a meeting of the California Debris Commission last Monday. No hydraulic permits were granted. Applications are pending from A. Morse, owner of the Nugginsville mine near Downieville, and John R. Jones, owner of the Waukshaw mine at Relief Hill, Nevada county.

IN a dispute about the amount due A. R. Blake by A. Ball, for whom Blake had been doing prospecting work, Ball shot Blake through the heart with a Winchester at his (Ball's) home in the Salmon river country, Siskiyou Co., last Saturday. Upon preliminary examination Ball was acquitted on grounds of self-defense.

SECRETARY CARLISLE has issued a circular concerning the coinage of silver dollars under this administration, the coinage being under the unrepealed portion of the Sherman act. It shows that since the present administration took control, 1,957,223 standard silver dollars have been coined, of which 520,069 have been seigniorage.

THE Ashland, Or., *Record* says Horn & Co.'s Gold Note river mine on the Klamath is taking out rich pay gravel and will be on bedrock this week. The American Bar is also paying well, and will be in bedrock this week. They took out a five-ounce nugget the other day. The latter company have their wheel located on a suspension bridge.

THE old North Fork mine at Forest City has been reopened by a company that owns 1200 acres on the old Bald Mountain channel, besides timber lands and water rights. It is thought that a tunnel 2800 feet in length will bring pay. The channel they are running for is said to be very rich, the old Bald Mountain Company having taken out hundreds of thousands of dollars.

THE Rachael mine, Emma district, Eastern Oregon, has been bought by Messrs. Wallace & Wheeler, of Chicago, for $4150. There is an eight-inch vein of free gold ore in sight, with a 52-foot shaft and a tunnel 30 feet long. The purchasers are going to work at once and will put up a mill. The mine is in the same belt as the Virtue, which is turning out bullion in paying quantities.

THE owners of the Marion group of mines, Mercur district, Utah, have incorporated with half a million capital, and will enlarge their mill. The capacity of the plant will be doubled. The process of retorting the zinc precipitates, as applied at the Marion mill, has proved a great success, and a high percentage of the quicksilver contained in the ore is saved by this means, for which a ready market is found.

THE development of the Red Cloud mine in Mariposa is so satisfactory on the 700-foot level that the management has decided to sink another 100 feet. On the 600-foot level a disturbance occurred that threw the pay chute off its regular course, but the work now done on the 700-foot level justifies the belief that as depth is attained it will resume place among the gold producers of the Pacific coast.

T. C., J. W. AND S. T. STERRETT have brought suit against G. S. Montgomery, C. N. Crittenton, J. W. Martin, P. Kyle, et al., for $200,000 damages, the cancelation of certain contracts and the repossession of the Sterrett mine in Placer county, said to be worth $250,000. About two years ago plaintiffs made a transfer of their property under certain conditions, and now claim that they were defrauded.

THE Cleveland mine, located near Springdale, Wash., has been sold to parties from the Slocan country, the consideration being $150,000. An assay is as follows: Forty per cent lead, forty ounces of silver, fifteen per cent zinc and a trace of gold. Springdale, on the Spokane & Northern, will be the shipping point. The mine will be worked at once, as part of the purchasing contract calls for a weekly shipment of 600 tons.

A VANCOUVER, B. C., dispatch says: Though the brush fires have been very extensive in British Columbia, the damage has been comparatively small and the miners are looking forward to one advantage which, it is said, will result from the fires. The moss and grass will be burned away from the face of the rocks, and when the rain washes the ashes off the rocks will be bare, and prospectors will have a better chance to discover ore veins.

AT White Oaks, New Mexico, two merchants, named Sewartz and Rosenthal, stole a gold brick, weighing $18\frac{3}{4}$ pounds, worth something over $4000. They had to cross a desert country a hundred miles to a railroad. They were suspected and could not get away with their stealings. Detectives were put on their track, says *Bullion*, and evidence collected sufficient to warrant their arrest. They confessed the theft and returned the brick, which belonged to the South Homestake mine.

THE Cripple Creek, Col., *Crusher* says: "The Pueblo and Denver smelters are very hungry for the Cripple Creek siliceous gold ores, and their buyers now make more trips into this district than into any other in the State. The reason for this is plain, as there is no fluctuation in gold values and the smelters take no risks now on silver tonnages. But the smelting charges on Cripple Creek ores are very high and should be reduced at once. Concerted action on the part of the heavy shippers here would lead to speedy reduction. There is no reason in smelters charging $14 per ton on gold ores which cost only about $7 per ton to smelt, and there is a clean margin on the gold up to the difference between $20.66 per ounce which the smelters receive, and the price they pay, which will not average as high as $19.50 per ounce. And the moisture deductions made on ore from this dry camp amounts to virtual robbery.

THE owners of the Golden Fleece mine in Hillsdale county, near Lake City, Col., recently refused $1,500,000 cash for that property, offered by a New York and London syndicate. The Denver *Mining Industry* thinks it requires a good deal of both faith and nerve to refuse so much money in hand for a mine. So it does, but there are several gold mines in this State for any one of which the owners would refuse to accept that sum. Four times that amount was recently offered for the Utica mine, Angels, Cal., and refused.

E. REED, the general manager of the Bobtail mine, near Central City, Col., was killed last week. He was examining the mine, accompanied by a party of mining experts, and with two other men got into the bucket to go to the surface. The collar of the shaft was reached, but when the engineer attempted to stop the cage the brake failed to work and it continued to the sheave, where the bucket was overturned and Mr. Reed fell to the bottom of the shaft, a distance of 500 feet, and was instantly killed. The others fell on the curbing and escaped.

FOUR HUNDRED AND FIFTY men are now employed by the United Verde Copper Company, Jerome, Arizona, and it is reported that the force will soon be doubled. A correspondent of the Prescott *Courier* says that this can easily be done, as the mountain upon which the mines are located is one solid body of mineral, varying to some extent in richness, but the whole can be worked at a profit. Improvements and additions are continually being made with a view to increase the output of the mines, the latest being a converter which will convert the matte into copper.

THE *Enterprise* reports excitement over the strike just made in the Zira-Schultz mine at Pine Nut, Nev. A piece of rock about the size of an egg weighs just twelve ounces, and is variously estimated to contain from one to two ounces of rich gold worth $19 per ounce. The rock is decomposed quartz mixed with feldspar and black manganese. Gold sticks out of the rock and runs through it in all directions. It would be easy with a pair of pinchers to pull out dollars' worth of gold. Some of the gold sticks out a quarter of an inch, and pieces in sight were worth two or three dollars.

THE Morning Star at Gold Flat, Cal., is favorably spoken of by the local papers, which say that all needed to make a good mine is development, which entails more money than the present owners have. An incline shaft has been sunk to a depth of eighty-seven feet, and the ledge in the bottom is from ten to fourteen inches wide. The quartz is heavily sulphureted and shows free gold. Crushings made have paid from $25 to over $60 per ton, not including the sulphurets. An assay of the rock made some time ago showed it to contain $226.36 per ton in gold and five ounces of silver.

STRAINED relations between the Grass Valley miners' union and the management of the Osbora Hill Mining Co. resulted last Wednesday in a large delegation from the union driving the superintendent out of town. The chief difference appears to be regarding the number of hours that shall constitute a day's shift. The mine management ask that it shall be ten hours. It has been the custom in Grass Valley to work nine and a half hours. There will be a meeting of the mine management and the executive committee of the miners' union to-day, at which it is expected an amicable agreement can be reached.

THE mill of the Butte Saddle Company near Downieville is completed. Ten stamps will be run. There are 6000 feet of tramway, requiring 24,000 feet of wire. Eighteen men are employed. An upraise is being made for air. The machinery will be propelled by water power. If water becomes scarce an electric plant will be obtained. The two pay chutes are two to ten feet wide, ore averaging $8 to $10 a ton. The wagon road to the mill is half a mile above Sierra City, and thence by trail a mile and a half to the mine, 2000 feet above the Sierra Buttes ledge. The rock formation is similar to that of the Sierra Buttes.

A MINER from Silver City, Idaho, tells the Wood River, Idaho, *Times*, that everything there is very high. Cordwood is $10 to $15 per cord, and it sometimes goes to $20 in winter, as when brought in on "jacks," eight sticks being a load that is thus brought 18 or 20 miles from the timber. Coal is $30 to $40 per ton. It costs a cent a pound to haul it from the railway at Nampa or Caldwell. Rents are also high, and, the *Times* thinks, with high rents, high freights and high prices of everything, a miner at Silver City is not nearly as well paid at $3.50 as he would be in the Wood River country at $2.50 per day.

MESSRS. RUMMEL AND PARSLEY recently found a rich pocket of gold quartz on Ash creek, a tributary of Klamath river, about eight miles below Hornbrook, from which they cleaned up $1500 with a hand mortar in one week. A miner named Reeder has mortared out nearly $10,000 during the past eighteen months from a small quartz ledge, which he has located just across the river from Ash creek. He calls his claim "Fool's Paradise." About a year and a half ago he struck the first pocket and took out $4000. Since then he has found bunches which yielded as follows: One each of $150, $300, $3200, $1790, the last amount being cleaned up by himself and another man in eight days in August. The gold is found in kidneys, or pockets, lying between the quartz and porphyry.

Personal.

GEO. BERLENER is back from Alaska, where he has been expertising mines.

T. SIMMONDS is now superintendent of the W. Y. O. D. mine at Grass Valley.

C. E. GRUNSKY has received the merited compliment of a non-partisan nomination for Superintendent of Streets for this city.

Obituary.

THOS. CAHILL, the well-known assayer and mining expert, died at Kingston, N. M., last Tuesday, aged 65 years.

The Murphy Gold Process.

The following on the Murphy gold process is prepared by J. G. Murphy, its inventor:

Is a gold mine valuable? The question involves a knowledge of the values of the ore per ton and the cost of the treatment. The cost of treatment depends upon the character of the ore. The common operations for the extraction of gold are milling and smelting. The cost of milling per ton in a mill of say forty stamps, will not exceed $1.25 per ton (a high estimate). The charge for smelting is $15 to $20. It is apparent at once that ores which would not be commercially profitable for smelting would pay handsomely if milling were possible. In general, milling ore would not pay for the cost of smelting unless it was exceptionally rich. Suppose an ore to be worth $8 per ton, but is, nevertheless, free milling, an exceptionally high saving by the milling process as now conducted would be seventy-five per cent. Seventy-five per cent of $80 equal $60; less $1.25, cost of milling, equal $58.75. When the ore is sold to smelting companies they usually pay for ninety-five per cent of the assay value of the ore and deduct $15 to $20 per ton for treatment. Now, ninety-five per cent of $80, $70; less $15 or $20, cost of treatment, $61, or $56 net. In such a case as this it will be seen that there is but little choice between milling and smelting, as the increased saving by the latter method balances the difference in the cost of treatment. But the majority of gold mines will not yield ore of sufficient richness to pay the smelting charge alone. We often hear stories of mines which are said to yield ore to the value of $200 and more per ton. Samples can be obtained from any gold mine which will yield by assay $1000 to absolute gold approximating several hundred thousand dollars per ton, but on a commercial scale by carload lots there are but a small percentage of the mines that will yield ore of the average value of $10 per ton, but this value will not pay the smelting charges. In a majority of mines from which the ore is shipped to the smelters careful selection is needed, and often not more than ten per cent of the output can be shipped with profit. Of the total gold production of the world, more than ninety per cent is the product of mill and placer operations.

We now pass to the question of what constitutes a free-milling gold ore. The answer to this is by no means easy. In the usual acceptance of the term, it is an ore which will yield a sufficient percentage to the milling process to make the operation commercially profitable. Rock cannot be properly called an ore unless by metallurgical treatment it will yield a profit; hence we see that rock which will yield $20 per ton, but not free milling, cannot be properly called an ore, while a ten-foot vein of $8 ore (free milling) would be very valuable.

Is the product of a mine in which gold occurs in the native state correctly termed free milling in all cases? Let us examine this question with care. The stamp mill is the machine employed for the reduction of free-milling gold ores. Briefly, it consists of a stem tappet, head and shoe, weight 650 to 1200 pounds: the latter weight now in use in the Black Hills, Dakota. This weight is lifted by the cam, which is attached to the cam shaft, to a height of eight to fourteen inches, the latter drop being used in the Rigby mill, so called. The number of drops is fifty-six to ninety per minute, the smaller number of drops corresponding to the higher lift. This weight falls in a mortar directly on top of a die of the same diameter as the shoe. This die will be on an average four and one-half to five inches above the bottom of the mortar; the ore is fed into the mortar in modern practice by a self-feeder, and is crushed between the shoes and dies.

A quantity of mercury is fed directly into the mortar, varying in quantity with the richness of the ore. As the ore is pulverized the gold is liberated, which, falling to the bottom of the mortar, comes in contact with the mercury and is amalgamated. The amalgam so formed is saved in battery and outer plates of copper, the surfaces of which are amalgamated. We will not discuss this subject in detail, as we are dealing with principles only.

A current of water passes through the mortar, which is the power that discharges the crushed ore from the mortar. The discharge is through screens of forty mesh (1600 spaces per square inch). The quantity of water used is twelve miners' inches, 144 gallons per minute for a mill of sixty stamps; or one miners' inch, twelve gallons per minute, per section of five stamps. It will be seen that the capacity of the mills depends upon the rapidity of discharge. The attempt to use sixty-mesh screens has been made. This was found impracticable, because the capacity of the mill is greatly reduced and the screens clog and break from pressure. Of all the machines used in the metallurgy of gold, the stamp mill plays by far the most important part, consequently we should examine it with care.

We see that it requires a large quantity of water; that a forty-mesh screen is the finest that can be used economically; that the gold, when liberated, must be amalgamated and caught on copper plates. We have stated that in no case would the stamp mill save more than seventy to eighty per cent of the total gold value. Let us seek the cause. The particles of which all rock is composed vary greatly in size. This is especially true of the particles of gold contained in any free-milling ore. The coarse gold is, as a rule, saved in a well-conducted stamp mill operation. The fine, however, cannot be saved by this process. The cause of the loss has been assigned to the flowing away of fine gold in the current of water passing through the mill. I believe this to be true to some extent, but only the cause of a fractional part. The percentage of coarse and fine gold contained in ore is variable in different mines and different sections. Some mines, as the Gloster, Southern Cross, Red Lion, Broadway, etc., contain forty to eighty per cent, often more, of the total value of the ore in the form of flour gold. These mines are rich in chemical value; commercially, however, the Gloster mill will not yield more than fifty to sixty per cent to the stamp mill, the Southern Cross and Red Lion twenty-five to thirty per cent, the Broadway forty per cent. For this reason, these mines and others have not been profitably and properly operated. The ores of these mines are of good grade for a milling operation, but not sufficiently rich for smelting. All the ores of the Gibbonville (Idaho) district fall under this head.

Among the rich and famous sulphuret mines may be mentioned the Moose and Dolly Varden, situated on Moose Hill, near Alma, Col.; the Gregory and Bobtail mines, near Black Hawk, Col. These mines produced millions in gold ore, all of which was smelted in the establishments of Professor Hill, one of which was located at Alma and the other at Black Hawk. The ore was very rich, and in addition to the mining, smelting and shipping charges, yielded the mine owners good profits. The gold in these mines was associated with copper pyrites and peacock copper bornite. I saw another mine equally and even more famous than either of those mentioned above, in which existed large chambers of mixed sulphuret, iron pyrites, copper pyrites, magnetic pyrites, and peacock copper, all rich in gold and treated by the stamp mill. This is the Cable gold mine, of Phillipsburg, Mont., owned by J. C. Savery, of Des Moines, Iowa. The writer made a detailed examination of that mine nine years ago. The mine was equipped with a forty-stamp mill. The gangue of the ore was chiefly limestone, in which occurred the large chambers of the sulphurets mentioned. It astonished me to see this ore all put through the stamp mill, and I even suggested to Mr. Savery that he was sustaining a heavy loss. He called my attention to the fact that he had an assay office, and invited me to determine the loss. My astonishment can be imagined when I found that the percentage of saving in the sulphuret was equal to that in the limestone. Investigation of this statement is invited. This absolute contradiction, not of statement, but, in fact, of all that had been written on the subject, caused me to examine all of my personal experience, and to consult others. The result was that more than eight years ago I reached a conclusion, which was announced recently in pamphlet form almost simultaneously by chemists of Boston and San Francisco, viz., that gold in pyrites is mostly, if not entirely, in the free state. The chemists who wrote the pamphlets announced the existence of gold in iron pyrites (their investigation does not appear to have extended further) in three forms —free, enveloped mechanically, and chemically combined. The latter condition is said to be most rare. I doubt if the latter condition exists at all, and in the absence of proof, which is not furnished in the pamphlets, I adhere to my opinion. Usually the size of a particle of iron pyrites or any other sulphuret contained in an ore is small, so small, indeed, that they will readily pass through a forty-mesh screen, the size of screen used in a stamp mill. If gold is contained in such pyrites the stamp mill would not save it, as it would pass through the screen unaltered.

Let us now think over the preceding matter carefully, and then see if we can decide the cause of the loss of flour gold, and why the gold in pyrites is usually lost in a milling process. Is the heavy loss due to the flowing away of flour gold by the current of water passing through the mortar, or is it due to the fact that the rock is not broken sufficiently fine to free the gold from the gangue? The great percentage of pyrites found exists in small particles. If pulverized sufficiently fine, can any contained gold be amalgamated? We have now reached a proper point for discussion of the Murphy gold process.

This process may be considered worthy of consideration from a single fact—viz., that investigation is asked. The designer will be glad to have errors pointed out and improvements suggested. This process, designed by myself for the Hartford Syndicate (Limited), comprehends the union of several well known machines. If any of these can be beaten for its special department, I will be glad to know it and give the substitute its proper place.

The essential features of the Murphy gold process consist of pulverizing to a fine state of division, and even to an impalpable powder if the fineness of the gold demands it; then the formation of a pulp of the consistency of a thin paste in the well-known combination pan, to which we give preference, at the end of which are the usual settlers, also so well known that space for description would be wasted here. The effect of the arrangement of these machines would be—

1.—That no matter how fine the state of division in which the gold exists in the ore may be, it will be liberated from the gangue and rendered fit for amalgamation.

2.—That there will be no current of water to float the flour gold off.

3.—That the process can be employed in sections where there is not sufficient water to run the stamp mill.

4.—That at all stages the process is completely under the control of the operator, so that the batch does not need to pass from the pans to the settlers.

As to this process and how cheaply it will treat gold ores, the general description which follows and a study of the plans will be an indication. The mill is entirely automatic, and but a single man at the rock breaker is needed for a plant of fifty tons or more.

The ore as it comes from the mine is dumped on grizzlies. The fine material passes through, and falls to the bin; the coarse lumps fall on the crusher floors directly in front of the crusher's jaws, which should be so set that they are on a level with the floor, thus avoiding lifting. From the crusher bin, which is inclined, the ore passes directly to a set of rolls, where it is crushed to a thirty or forty-mesh screen (900 to 1600 spaces per square inch). After being crushed, the ore is elevated, and that which is not fine enough to pass through the screen goes back to the rolls; that which is fine enough passes through the screen into a bin which communicates with the continuous feed and discharge pulverizing cylinder. This continuous feed and discharge pulverizing cylinder is the machine to which special attention is called, and to the operation of which the success of the process is due. There are 3000 of these cylinders (old style) now in use pulverizing flint and feldspar for use in the manufacture of porcelain and pottery. These machines can be seen in operation at Brandywine Heights, Del., South Glastonbury, Conn., etc. The fineness to which it is necessary to pulverize these materials for use is 200 mesh for porcelain and 250 mesh for glazed ware (40,000 to 62,500 spaces per square inch). This machine is patented and known as the Alsing cylinder, manufactured by the J. R. Alsing Co., 60 New street, New York. For the amalgamation of gold it is not thought that it will be necessary to pulverize to 200 or 250 mesh. The ore, pulverized as finely as may be necessary in the cylinder, is conveyed by the discharge pipe to a bin, the bottom of which is arranged in the form of a hopper to feed directly into the pan. The remainder of the operation is exactly that used in a silver mill, and will not be discussed, as the operation is well known.

From the preceding description it can be seen that the operation is entirely automatic.

The cost of treatment, as has been shown, is of primary importance for gold ores that will not bear the cost of smelting charges. The cost of crushing by the rock breaker and rolls will not exceed forty cents per ton. The cost of pulverizing to 200 mesh will not exceed $1 per ton when the ore is first put to a thirty or forty-mesh screen. Taking the total cost at $2 per ton for crushing, amalgamation and retorting, it is seen that by this process we can treat the ore from a large number of mines which by the ordinary process could not be made to pay until the amalgamation is completely determined by the usual method of panning samples.

5.—That ninety to ninety-five per cent of the gold contained in any free-milling gold ore can be saved. This may and will likely be questioned. Apply the following test for confirmation: Take any free-milling gold ore, pulverize to 125 to 200 mesh (generally 100 will do), take a casserole or other proper vessel, into which put the pulverized ore, wet to the consistency of a thin paste, take a common egg beater, and after introducing the proper amount of mercury agitate the mass for an hour. The result will show a saving of ninety per cent. This is not so perfect as the combination pan, however. The work of the pan is as follows: The muller slaps the pulp out to the periphery, the spiders slap it back, thus making two lateral forces. The revolution of the muller creates a vortex of about six inches in diameter, in and out of which the material constantly passes. We thus have three forces to effect the perfect contact of the mercury with the gold; and, therefore, say that the Murphy gold process will save ninety per cent, even ninety-five per cent, of the gold contained in any ore, unless it contains elements which will foul, contaminate or consume mercury, such as native copper and the ores of lead. In the Broadway mine there was a deleterious element in the gangue of the ore which operated against close saving. Professor Clayton was called upon to see if he could not devise some means to save more than forty per cent of the value contained in that ore. He spent considerable time in the endeavor to effect that result, but without success. The Professor informed the writer that the Broadway ore contained considerable talc in its gangue, which acted as a grease and prevented the union of the gold and mercury. I will not discuss this, but in the Murphy gold process the existence of talc as a part of the gangue would in no way affect the amalgamation. The whole thing is in the pan,

and the forces mentioned are sure to bring about contact of the gold and mercury, which is all that is needed. It makes no difference whether the gold is obtained in iron pyrites, copper pyrites, peacock copper, etc.; it will be collected and saved by this process.

Dividend Paying Mines.

Mines operated in the United States paid $612,250 in dividends during the month of August, says the *Rocky Mountain News*, making the total of dividends paid thus far in 1894 equal to $4,610,134, a figure which challenges comparison from any other industry—the sugar trust excepted—according to the capital actually involved, which is not represented by the capital authorized in the articles of incorporation.

Of the August total Colorado contributed $125,000, or 20 per cent, which is marked to the credit of the following mines:

Elkton, Cripple Creek, $5,000.
Golden Fleece, Lake City, $12,000.
Moose, Cripple Creek, $12,000.
Rico-Aspen, Rico, $25,000.
Smuggler, Aspen, $50,000.
Union, Cripple Creek, $6,200.
Victor, Cripple Creek, $15,000.

In this showing all the close corporations are excluded, as they do not publish dividends. This applies to such mines as the Little Johnnie at Leadville, the gold producers of Gilpin, the York and Last Chance at Creede, and the Smuggler, Union, Suffolk and Belmont of Telluride. Hence it is fair to conclude that the standing of the industry would be better shown by the unpublished dividends than by the fraction which is given to the public.

The dividends paid thus far in 1894—$4,610,134—drew $1,021,500 from Colorado mines. This means 22 per cent of the total, which is credited as follows:

Boreel, Leadville, $22,500.
Elkton, Cripple Creek, $40,000.
Golden Fleece, Lake City, $96,000.
Moose, Cripple Creek, $48,000.
Mount Rosa, Cripple Creek, $5,000.
Portland, Cripple Creek, $90,000.
Rico-Aspen, Rico, $200,000.
Smuggler, Aspen, $450,000.
Union, Cripple Creek, $25,000.
Victor, Cripple Creek, $45,000.

After paying the dividends for January the Cripple Creek mines were closed until the middle of July by labor troubles, thus cutting off their ability to even meet expenses.

Pennsylvania Company Stores.

Every merchant is guided more or less in the purchase of his supplies by the character of his customers, but the men who run the geueral stores in the coke regions of Pennsylvania have more peculiar ideas to meet than is the lot of the average storekeeper. These stores are all controlled by the owners of the mines, and it is said that some of them force their men to buy from them exclusively. The profits of these stores are undoubtedly large, although the prices at some of them at least are lower than they are at the usual country stores. The unique features of the wares carried in the stores are enormous feather beds, Polish and Hungarian head dresses, heavy boots for the women as well as the men, and all sorts of gaudy shawls and dress stuffs. Among the special provisions these stores supply are highly seasoned sausages and hams, such as are found in the Hungarian and Polish quarters of the town. The Poles are much more extravagant than the Huns and buy much better and higher priced goods. The Huns buy the cheapest kinds of meats, of which they make their golashes. They do not buy very much of anything in the way of provisions, however, relying largely upon their gardens for vegetables, and occasionally killing one of their ducks or geese. The Poles, on the contrary, rely very little upon their own efforts, although they also have good gardens, but purchase the best goods that the stores have. Very few of the purchasers pay cash. Instead, they secure from their foreman tickets for various amounts. These are presented at the stores in payment for supplies, and the clerks mark on them the amounts of their purchases. When the whole value of the ticket has been contracted for it is taken up by the clerk of the store.

At least a million dollars have been spent in this vicinity during the past five years in various enterprises, mining and agricultural. It is a sorrowful fact that to-day only one or two out of the dozen or more started are doiug anything. The enterprises themselves were feasible and good propositions. If they were all going uow we would have had good times here in spite of the general depression over the couutry. The explanation of their failure will be found generally to be poor management.—Yuma Times.

The present 1500-foot tunnel and turbine wheel pit of the Niagara Falls Power Company will, when it shall work at its full capacity of 100,000-horse power, divert 3.64 per cent of the total volume of water and reduce the depth of the crest along the entire falls to the extent of one inch and four-fifths.

Famed Meadow Lake.

Meadow Lake, which has such a wonderful history, is situated about eleven miles north of Cisco, Cal. There still remain portions of the old wagon road which was hewn out of the rock during those palmy days. At one time it was traversed by scores of freight wagons, and several trips daily were made with eight-horse fourteen-passenger stage coaches.

The manager of the Colfax *Sentinel* recently made the trip on horseback. The old stage road was crossed again and again by the trail. In some places trees many inches in diameter have grown in the very center of the road. For the greater part of the distance the road is still in good condition, though in many places the stone walls have given away. At best the trip by stage to Meadow Lake must have been a wild one.

At one time Meadow Lake had a population of 5000. During many years subsequently old man Hartley, the hermit, was the sole inhabitant. Hartley's death occurred, however, about two years ago.

A more picturesque spot than the site of this once world-famed mining town would be difficult to fiud, while the lake itself is enchantingly beautiful.

The lake is about a half-mile in width and extends along the depression of this mountain meadow a distance of nearly four miles. Surrounding the lake is a tract of level land comprising 40 or 50 acres, and the whole is almost completely enclosed by rugged peaks.

A score of buildings are all that mark this once busy city. The others have succumbed to the ravages of fire or been crushed by the heavy snows of this region.

Here at oue time could be found fiue churches, theaters and dance houses; schoolhouses, saloons, bakeries, breweries, banking houses, hotels and a daily newspaper; and a mining stock board in daily session.

The ruins of one stone building may still be seen. It was built by Perkins & Smith of Brady City, Sierra county, at a cost of $32,000.

Many persons who have never visited the camp will remember it distinctly from the fact of the regular assessments which they paid on mines located in the camp for them.

Some persons who have uever visited the camp are hasty in saying that the gold is not in the quartz. After visitiug a half-dozen ledges aud prospectiug the ore, the writer did uot find a ledge that showed less than twenty colors to the pan. He even took a horn of the tailings that passed from the plates at the old Californiа mine (formerly the property of Ralston) and secured from it more than a score of colors.

F. Chappellet, oue of the pioneer drift miners of California, now president of the Mayflower mine at Forest Hill, took an eight-stamp mill to Meadow Lake for the Mohawk and Montreal. During its operation he shipped more than $20,000 worth of bullion, but the ore was so rebellious that it could not be worked with profit, and one November day, wheu the first snowflakes began to fall, he rolled his blankets and walked out of camp several thousand dollars loser.

Following is a list of deserted stamp mills that still remain in Meadow Lake district:

12-stamp mill on the Grant.
10-stamp custom mill at Carlysle.
8-stamp mill, Mohawk and Montreal.
10-stamp mill, Orofino.
10-stamp mill, California.
5-stamp mill, above California.
10-stamp mill, Excelsior.
5-stamp mill, Old Wisconsin.

There are more than a score of arrastras and two smelters.

Within the past twenty years claims have been made that a successful process to work the ores had been discovered, all of which have failed.

A company from Salt Lake, backed by Stocktou capital, are at present hauling extensive machinery from Truckee to Meadow Lake. They claim to have successfully treated the rebellious ore.

On the strength of this, every claim and extension in the camp opeu to relocation has been taken up within the past six weeks. The following are locations:

The Excelsior, one of the best mines in the camp, belongs to the Hartley estate. It is a patented mine. Hartley had a process by which he worked his ore, and by it secured much gold, enough to keep Mrs. Hartley, the slayer of Seuator Foley, iu good society, with a frequent trip to Europe. Wheu he died he was preparing to work his ore on a larger scale. Mrs. E. A. Hersey, of Cisco, possesses the full knowledge of his process.

The Champiou mine is owned by Mrs. E. A. Hersey of Cisco, and is an extension of the Excelsior. It is a well-defined ledge from four to eight feet in width and shows free gold in many places.

The Oakland, O. K. and Gem have recently been located by Geo. Colby of Oaklaud.

The Bodie, R. A. Campbell and Wheeler.

Washington, William Hannah of Cisco.

Good Hope and Emma, by O. S. Holbrook, who recently died in Nevada county hospital, have been taken care of by his sons.

Grub Stake and Orofino, by J. P. Clark of Meadow Lake and F. J. Cook, now engaged in hydraulic mining in South America.

Black Cloud, G. S. Cook of Sierra City.

Enorma, F. J. Whitney, Wheatland, Cal.

The Nile, Thornton Davis, G. G. Davis and John Clark, the former of Sierra Valley.

Snowstorm, J. A. Morgan, Sierra Valley.

Dixie, C. Wichman and B. F. Atkinson, Sierra City.

The Sierra City, G. S. Cook and J. P. Clark.

The Central View, Jno. Spelenberg, Al Nicholls and Thos. Labroucke, Sierra Valley.

Little Daisy, Robert Sharkey, Sierra City.

Columbus, Northup Bros., Sierra Valley, one of them postmaster.

Sierra, formerly Old Pay Role, Thornton Davis and wife, Sierra Valley.

Diamond, Jno. Spelenberg, of Sierra Valley; Wm. Lehman, of Marysville; Jno. P. Clark, Meadow Lake, and Mr. Grant of Oakland.

Niagara, Jno. Spelenberg and F. X. Labonte, Sierra City.

Abe Lincoln, formerly Mohawk & Montreal, Joe Williams, Marysville.

Monumental, Watts Hughes and James Hill, Sierra City.

Lake View, A. H. Bemis of Salt Lake.

Mining Prospects in the Sierras.

A trip in the Sierras in uorthern California reveals much of interest to the casual observer. Rugged pine-clad mountains, intersected by canyous, creeks aud rivers and interspersed by beautiful valleys and lakes, are to be seen ou every hand. To one in search of the precious metals or the geologist, however, writes "Rambler" in the Reno *Journal*, something yet of greater interest presents itself. In this region is to be found that which has given to the world, directly or indirectly, the greater part of the wealth produced by the placer mines of California, the "Blue Lead" of miners' phraseology.

This most wonderful of ancient river channels has not received the attention that it merits from geologists or other scientific men. The study of it reveals the marvelous changes that have occurred in the topography of the country since the waters of the old river flowed from their unknown source—presumably in the north. This channel, which was ouce the lowest portion of this region, is now the uppermost portiou of some of the highest mountain ranges. It thus shows the working of the stupendous forces which have raised the once depressed region to its present height.

The general trend of this river was from north to south. It has been traced, by the blue gravel that is found in its bed, through the greater part of California, through Arizona and into Souora, Mexico. It, seemingly, has cut through innumerable gold bearing quartz ledges in its course and much of the wealth that was coutained in them is now distributed throughout the length of its bed. In nearly every place where the rim of the channel has broken down aud the coutents of the bed were forced out, rich placer mines have been found that in many places contained millions of dollars. Nearly all the rivers that have cut through this ancient river bed have also contained gold in great quautity. The "Blue Lead" has only in a comparatively few places beeu brokeu down or intersected by modern rivers. From this it will be seen that the greater part of its gold remains intact, awaiting the efforts of the miner to briug it forth.

On the portion of the channel that runs through the Grizzly range of mountains, west of Grizzly valley, several Reno companies have located claims. One of them has been sinking a shaft in order to ascertain the proper level at which to begin a tuunel. Another will commence tunneling soon. The rim of the channel has been broken down both north and south of these claims and rich surface placers have beeu the result. If one can judge by the large amouut of gold that has been taken from similar places on the "Blue Lead," he may reasonably expect those penetrating it at this point to reap a rich reward. The prospects are very eucouraging, to say the least, and well may those interested be enthusiastic.

Evidently placer mining in this part of California has only begun. In addition to the "Blue Lead," there are secondary channels cutting it aud mauy local channels, all of which will yield fabulous wealth. It may be said that ouly the rich surface deposits have been worked. A wise providence never designed that oue generatiou should despoil nature's treasure house of all its wealth; hence these deeper river deposits, where much time and labor are necessary to secure the gold they coutain. After all the precious metal has been taken from the placer miues some future generation may discover buried under lava caps iu the north the original ledges from which all this wealth has come, aud when this is done gold may become so plentiful that a cry will be raised for its demonetization.

Methods of Mine Timbering.

NUMBER IV.

Underhand stoping is the term used to indicate an operation the reverse of that described, being the method by which the miner takes out the floor of his level and continues the excavation downward in a series of steps seven or eight feet in height. In this method it is best for the economical handling of the ore, for ventilation, and for drainage, to have established a connection by winze with the level next below, or it will be necessary to hoist all the ore and water from the stope to the level above. The waste, if there be any, is thrown on platforms or floors between the face of each floor and the winze, slide or chute. This method is not advisable except in narrow, rich veins.

Underhand stoping is not commonly followed, but may be recommended in working small veins of very rich ore. It requires usually more timber than overhand stoping and the timber cannot be recovered as in the latter method.

In placing stulls to sustain the weight of waste, or to store ore already broken, the size and number of timbers to be employed must be determined by the width of the vein and the height to which the waste or ore is likely to accumulate. It is considered better to increase the number rather than the size of stulls. With good walls, stulls seven feet in length, having a thickness of twelve inches, placed thirty inches apart, are calculated to sustain sixty feet of waste or broken ore in a vein standing at a high angle. After waste has remained in place for some time it settles, and in some instances becomes so firm as to retain its solidity after the stulls have fallen out or have been removed. This need not be expected in wide veins.

When it becomes necessary to quickly catch up settling stull timbers or caps, a stout post, which will just slip under the sinking timber, is placed in position and four stout wooden wedges, having the inclined planes sloping alternately in different directions, are driven in between the post and stull. This plan will recover the subsidence, if not too great, and permit of reinforcing the timbers without losing ground.

A peculiar method of timbering, known as the "saddle back," is in vogue in some portions of Colorado. It appears to do well in the lead-silver mines having good limestone roofs and walls. It may be considered a modification of the "square-set." It requires less timber and is far less substantial. It will not do in heavy ground. The details differ with the various conditions encountered, but the principles are those obtaining in all other timber systems—the application of resistance to pressure. The drawings illustrate one method of setting up the saddle back.

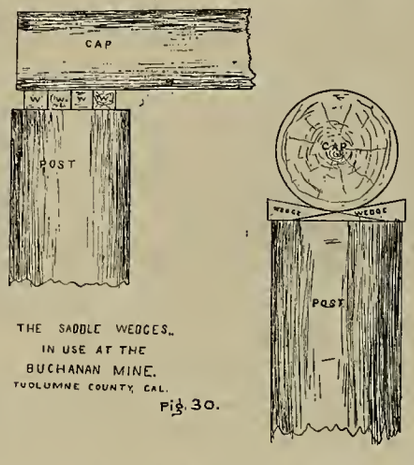
The accompanying sketch shows a design for a loading chute or slide, though they are not always made as elaborate as represented in the drawing. The inclination of the bottom should exceed thirty degrees, ores that are soft and wet requiring the slide to have a greater pitch than those that are dry. Between the two upright posts, which reach from the floor of the drift to the roof or to stout stulls overhead, two short uprights are placed, and on top of them, reaching from one to the other, is laid a 4x6 scantling. The gate, furnished with ratchet and wheel and pinion, may be dispensed with, loose boards being substituted, which may be pried up, when desired, with a bar. It is well always to build loading chutes in a substantial manner, so that rebuilding may not be necessary. It is a wise plan to provide false sides and bottoms, which may be quickly renewed.

The posts supporting loading chutes are not always placed perpendicular. In steeply inclined veins it is sometimes desirable to set them inclining forward. In vertical veins they are built across the vein.

In square sets, ore bins are constructed within the sets and the chutes are attached to the caps or ties, being arranged at convenient distances from each other.

In some mines, as in the Golden Gate, at Sonora, in Tuolumne county, large storage bins are constructed below the floors of the levels at the hoisting shaft, provided with a loading chute. The skip is stopped at the proper point and loaded. In this manner the necessity of waiting for cars, or loaded cars and men waiting for the skip, is obviated. In this mine, loading chutes are provided on the several levels from the stopes overhead, as a matter of course being constructed in the ordinary manner.

The systems of timbering hereinbefore described refer particularly to veins having a width not exceeding twelve feet, though mines have been worked under great difficulties, and where the operations were attended with extreme danger, where the distance between walls was twenty and even twenty-five feet. An instance may be mentioned in California in the Mount Jefferson mine, at Groveland, in Tuolumne county, where the vein was twenty-five feet from wall to wall. A very ingenious system of timbering was introduced in 1854, or thereabouts, consisting of long stulls supported by wall and inside props seven feet apart. Longitudinal braces, or ties, were also introduced to support the timbers longitudinally, but the support was insufficient, and a most disastrous case resulted. It is a matter of absolute impossibility, however, to recover, by the methods thus far given, all the ore from such great masses of mineral as were found in the Comstock lode, where one ore body—the Great Bonanza—measured 340 feet in width at one point, 600 feet in height and 1250 feet in length. Stopes in the various

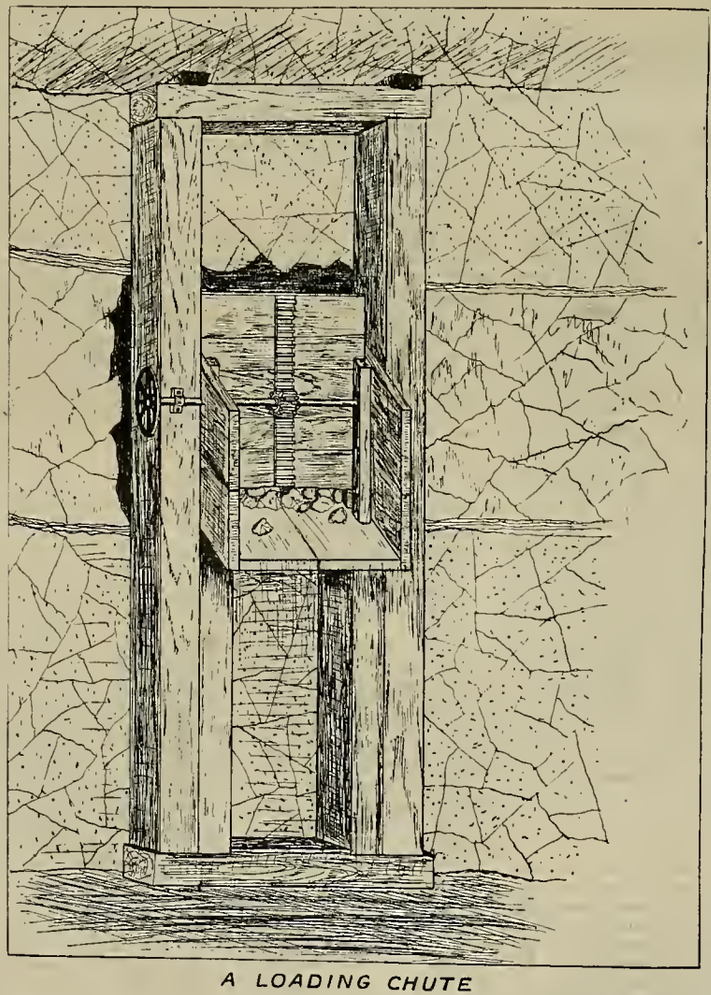


THE SADDLE WEDGES IN USE AT THE BUCHANAN MINE. TUOLUMNE COUNTY, CAL.

Fig. 30.

mines of the Homestake group, in the Black Hills, South Dakota, range from 40 to 150 feet in width and several hundred feet in length and height. The Caledonia mine, of this group, measured on the 300-foot level 195 feet horizontally. The Homestake vein at the surface, in the open cut, is 360 feet wide by actual measurement.

In California there are many mines of great value that cannot be worked by any system of stulls. The Stonewall mine, in San Diego county, has twenty feet or more of vein in places. The Alvord gold mine, in San Bernardino county, is a very wide vein. The Odessa, Occidental, Oriental, Silver Monument and



A LOADING CHUTE

Waterloo mines, of the Calico district, measure 30 to over 100 feet in width. Some of the mines of Bodie have very broad veins. The Josephine mine, in Mariposa county, has an immense ore shoot fifty feet wide. The Utica-Stickles mine, at Angels, Calaveras county, is 40 to over 100 feet wide, and the Gover mine, of Amador, has an ore body 30 to 50 feet wide. The Zeila, at Jackson, is working an immense mass of ore. The Boston mine, near Mokelumne Hill, is 40 to 60 feet wide, and some of the ore bodies in the larger quicksilver mines are of prodigious size. In addition to these, there are many other mines on the gold belt of California where the great width of vein precludes the extraction of the ore by the use of any system of stulls or simple posts and caps.

Veins and ore bodies of large size can be safely, completely and cheaply mined by using what is known as the "square set" system of timbering, introduced in 1860 by Philip Deidesheimer, while superintendent of the Ophir mine on the Comstock lode.

The following interesting reference to early mining on the Comstock is from Monograph IV of the United States Geological Survey, "Comstock Mining and Miners:"

"At the fifty-foot level (of the Ophir mine) the vein of black sulphurets was only three or four feet thick and could readily be extracted through a drift along its line, propping up the walls and roof, when necessary, by simple uprights and caps. As the ledge descended the sulphuret vein grew broader, until at a depth of 175 feet it was sixty-five feet in width, and the miners were at a loss how to proceed, for the ore was so soft and crumbling that pillars could not be left to support the roof. They spliced timber together to hold up the caving ground, but these jointed props were too weak and illy supported to withstand the pressure upon them and were constantly broken and thrown out of place. The dilemma was a curious one. Surrounded by riches they were unable to carry them off.

"The company was at a loss what to do, but finally secured the services of Philip Deidesheimer of Georgetown, California, who visited and inspected the treasure-lined stopes of the Ophir."

That the ore body could not be extracted in the usual manner was at once apparent, and Mr. Deidesheimer says he set about his task with some misgivings. He did not at one stride grasp the idea of the square set, but the system which now bears his name was the outgrowth of circumstances and the very necessities of the case. He instituted a policy, however, the wisdom of which soon became apparent.

The first step was to crosscut the vein from wall to wall, starting from a drift on the hanging wall side of the vein. As the work advanced he set up posts and placed caps above them, not across the course of the drift as is usually done, but along the sides, the idea being to form, when completed, a line of caps which would reach continuously from wall to wall. To accomplish this the ends of two caps were placed upon each post, except at the ends. These novel sets were held in place by pieces of 2x4 scantling 4½ feet in length and reaching across the drift from near the top of a post to that opposite.

Having successfully driven the crosscut, Mr. Deidesheimer now ran a drift some distance along the foot wall, timbering with posts and caps in the ordinary manner; that is, the caps were placed upon the posts at right angles to the drift and parallel with those in the crosscut. The posts in each case were set perpendicular. Returning to the point where these operations were begun, a second section by the side of the first crosscut was taken out and timbered with a single line of posts and caps, the 2x4 scantling being placed as in the first case. When this section was completed there were standing three lines of posts surmounted by three lines of caps, extending from the foot to the hanging wall. This was not really a new idea, as Mr. Deidesheimer had previously employed the same method in his drift mine on Forest Hill, when the breast was carried in 125 feet wide, the roof being supported by rows of posts with continuous caps.

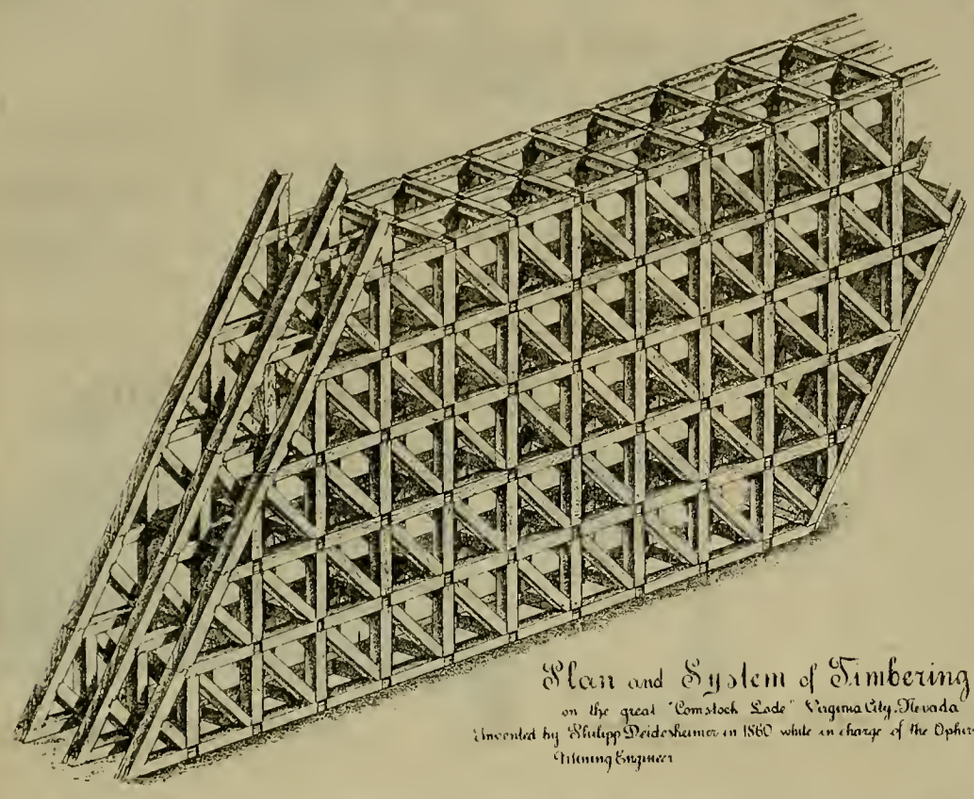
The work thus performed in the Ophir revealed the fact that an extremely rich body of ore extended upward from the level where this work had been done. The miners were directed to commence stoping upward in the body of soft, black, crumbling ore, and soon a considerable excavation had been made. It became evident that the ground must be secured at once.

In the Georgetown mine, that Mr. Deidesheimer had left but a short time before, the vein was vertical, and the walls were so soft and crumbling

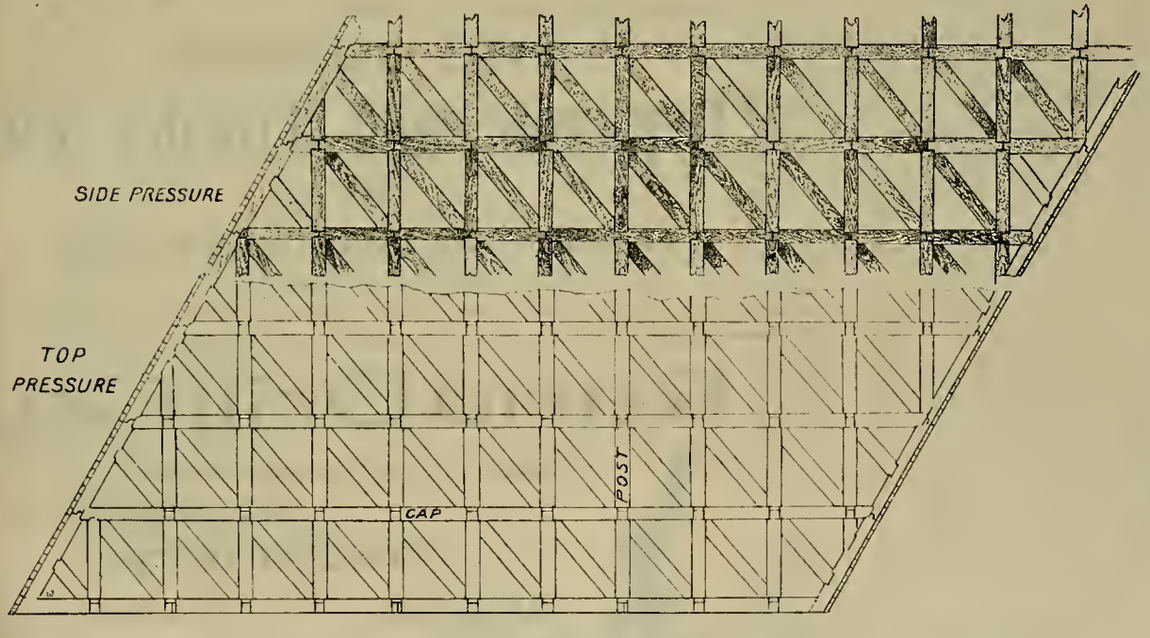
that, in order to stope out the mineral, he had resorted to the expedient of setting one post directly above another, the lower end resting on the cap, and in this way he managed to work the vein without much difficulty.

The Georgetown experience suggested the idea of adopting a similar plan in the Ophir. Accordingly, Mr. Deidesheimer had a mortice cut at the junction of two caps, which were already in place, and having a post framed with a tenon to fit, set the post in place directly above the one resting on the floor below. In a short time four posts were in position, with the caps upon them as below, together with the frail 2x4 scantling, the office of which was to keep the other timbers from falling down. The first an inch square. Two of these spikes were driven into a post at the proper height, and two in the post opposite, and the tie placed so that the ends rested upon these iron lugs, wedges being driven in at the ends to secure firmness. The posts and caps were now framed on the surface and delivered below, ready for use wherever needed. The work of mining now progressed much more rapidly and the problem seemed solved. Soon after it was determined to frame the timbers so that the ties might also rest on the posts. The stopes becoming of such great size, the dimensions of the timbers were increased and they were then framed as shown in the accompanying illustrations.

As the work progressed slight changes were made



Plan and System of Timbering
on the great "Comstock Lode" Virginia City, Nevada
Invented by Philipp Deidesheimer in 1860 while in charge of the Ophir Mining Engineer



"square set" timbers, it will be seen, were framed in the mine, the mortices being cut in the timbers in place. The work of extracting ore proceeded slowly yet, for the ground had to be secured as well as possible. It soon became evident, however, that something more substantial than 2x4 scantling would be required to keep the timbers in position, and it was determined to put in timbers of the same dimensions as those forming caps and posts. This was done at once, and the "square set" was complete in principle, though not in detail. The caps occupied all the space on top of the posts, leaving no resting place for the "ties," which had to be supported in some other manner. As they were looked upon as simply an auxiliary—a support to the posts and caps—they were only required to be held in position. Accordingly a lot of iron spikes were made, in shape somewhat like the thumb, having a sharp point at one end, the other end having a face three-fourths of from time to time whenever any improvement seemed possible. Sills were laid upon the floors of the levels as a foundation for the timbers above, which has now assumed massive proportions. The sill timbers were cut as long as it was possible to get into the mine. The men who were obliged to handle these ponderous timbers could see no reason why the sills should be longer than the caps, and had from the first looked upon the growth of this new system of timbering with much prejudice. When the great stopes were carried up from level to level the wisdom of the use of long sills became apparent, as they permitted the removal of all the ore and the placing of timbers without danger or loss, which could not have been accomplished with short sills, as when breaking up through the floor of a level from below short sills would have nothing to sustain them.

When, in the course of ore extraction, the work reached the walls, additional timbers, called "wall plates," were put in, as shown in the sketch of timbering in the Ophir mine. The caps were extended from the nearest post to the wall plate, except when a post came within two feet of the wall plate. In such case the cap extended from the wall plate to the second post in a single piece.

By a close inspection of the drawings the details may be plainly seen. It will be noticed that a system of braces reaching diagonally across the sets were also introduced, as well as close lagging on the walls. There is no doubt that the Ophir was the best timbered mine in the world, but the Comstock miners who gladly adopted the Deidesheimer system soon began to disregard many precautions which to them seemed unnecessary. The diagonal braces were left out, and the ground was found to stand about as well. Then, anxious to still further reduce expense and hurry the work of extraction, the lagging on the walls were dispensed with, and later, in somewhat firmer ground, the wall plates were left out, and finally the timbers were placed in rectangular sets, with only a few props here and there to the walls and roof. The disregard of these important details in American mines has resulted in numerous disastrous caves.

Owing to the careless timbering in the "Big Bonanza," in the California and Con. Virginia mines, cribs of solid timber had to be built, reaching from the floor to the roof.

(To be Continued.)

The Anti-Debris Association.

The Executive Committee of the State Anti-Debris Association held its regular monthly meeting last Tuesday afternoon at the rooms of the Board of Supervisors, in Sacramento. The counties of Yuba, Sutter, Sacramento and Colusa were represented by members of the committee. Chairman Morrison of Sacramento presided, and Robert Cosuer of Colusa acted as secretary. Reports from various committees were received.

The manager, W. T. Phipps of Marysville, presented his monthly report, showing the operations of the watchmen since the last meeting of the committee. He reported a general improvement in the rivers.

The attorney for the association, Robt. T. Devlin, made a report as to the condition of pending litigation and legal proceedings in preparation.

The chairman of the Legislative Committee, George Ohleyer of Yuba City, presented a report in which he called the attention of the association to encouragement given hydraulic mining in the platforms of the Republican and Democratic conventions, and stated that it presaged an attempt to secure by legislation what the courts had strongly pronounced against.

He stated that the miners were attempting to enlist sympathy by pleading that the hard times were due to the stoppage of hydraulic mining, and that the resumption of that industry would again bring prosperity to the land.

The Geographical Society of the Pacific.

The Geographical Society of the Pacific opened the course of meetings for 1894–95 last Wednesday with a paper on Corea, by M. Odagiri, Chancellor of the Japanese Consulate in San Francisco. Mr. Odagiri resided several years among the Coreans, and had constant opportunity to observe the people in their daily lives. The society has been at considerable expense to obtain new slides, showing landscapes, portraits of prominent Coreans, etc., to illustrate the lecture with the camera.

Apart from the inherent merit of the subject, considerable present interest attaches to Corea, it being the cause of the present war between China and Japan. The paper, which was read by Prof. Geo. Davidson, president of the society, was of value and favorably received.

At the second meeting a paper will be read by Jeremiah Lynch, of this city, corresponding secretary of the society, on the important discoveries lately made near Thebes, in Egypt, by the American exploration party, and also those of Flinders-Petrie.

Valuable Information Up to Date.

The MINING AND SCIENTIFIC PRESS of San Francisco has recently entered upon a new volume—the fifty-ninth of its honorable career. The event is celebrated by a new dress, which makes the journal more attractive to the eye; but it would be hard to make it more attractive in its contents, which afford a storehouse of valuable information, up to date, on scientific and mining subjects not to be found in any other paper o this coast.—The Investor, Los Angeles, Cal., Sept. 12.

Scientific Progress.

How Not to Use a Compass.

Mr. C. E. Finlasou, in his "Nobody in Mashonaland," gives an account of how he and his friends got lost in the bush, and shows what precious little use a compass is to travelers who bave not thoroughly mastered that simple-looking instrument. Mr. Finlason's landmark was certain telegraph poles, and when he and bis comrade lost sight of them they had to fall back on the compass, having had no sun that day to serve as guide.

"In taking my observatious I had carefully noted that tbe needle pointed dead at the camp, but I did not turn the compass so as to bring the needle over the "N." So it transpired that my observation was ouly useful in indicating the whereahouts of the camp when we got to the poles. Another little thing which added to the confusiou was the fact that I not did know for certain whether the black or white half of the needle pointed to the N orth, and I had also forgotten which end poined to the camp. And let me add that this little difficulty of the black and white needle is not at all an uncommon one with novices. They know all about it, of course, before they are lost, and would he indignant if auyone should infer (sic) that they were eveu likely to be in doubt on the point. But when ouce they are lost, and the fact, at first resisted, is slowly and surely borne iu upon them, it is surprising how speedily and completely their heads follow their bodies."

Mr. Finlasou and his two friends eventually found their way by tree climbing and the activity of anxious friends.

Origin of Petroleum.

Professor Mendeleeff advances the theory that petroleum is of mineral origin, aud that its production is goiug on and may coutinue almost indefiuitely. His hypothesis is tbat water finds its way below the crust of the earth and there meets with carbides of metals, particularly of iron, in a glowing state. Oil-beariug strata occur in the neighborhood of mouutain regions, where it may be supposed that the dislocations of the strata afford passages for the access of the water. The water is decomposed iuto its coustituent gases, tbe oxygen unites with tbe iron, while the hydrogen takes up the carbon and ascends into bigber regions, wbere part of it is condensed into mineral oil, and part remains as natural gas to escape wbere it can find an outlet, or to remaiu stored at great pressure until a bore is put down to provide it a passage to tbe surface.

Laboring in High Altitudes.

Some curious facts are brought to light on the capabilities of meu to labor at bigh altitudes during the construction of the Peruvian Ceutral Railroad. This line starts at Lima and, proceeding inland, reaches its highest point at the tunuel of Galeria, 15,645 feet above sea level. It is stated that men were able to do a fair "sea level" day's work as loug as the altitude did not exceed 8,000 to 10,000 feet above sea level, but beyond this there was a sudden falling off in the work of one-fourth to one-third up to heights of 12,000 feet, and at still higher elevations 100 men were required to do work easily done by fifty at sea level.

EXPERIMENTS by an English mine inspector have shown that gunpowder blasts in the presence of dry coal dust always unite more or less of the dust and will produce violeut explosions, increasing in force with the purity of the coal in a dusty atmosphere. He recommends discarding gunpowder, as certain "high explosives" (roburite, ammonite, etc.) prove to bc incapable of igniting or exploding coal dust.

ELI WHITNEY, grandson of the inventor of the cotton gin, is reported to have invented a machine for picking cotton that will do the work of 100 men.

Electricity from Coal Fields.

Electric power distribution is at present one of the most urgent of questions with the advanced electrical engiueer. Activities in this directiou so far are focussed in tbe utilizatiou of water powers. The success attending these efforts has, in a commercial and practical sense, demonstrated their value. This assured, the enterprise at Niagara is but the climax of a series of efforts, in which tbe humbler success is merged in the greater accomplishment. Where natural forces are available, and science succeeds in transmitting power to distant consumers on an economic and profitable hasis, the work of the engincer in this field is uot likely to be limited to a cataract or a tidal wave. Other sources of power are available where that of water may be too remote for practical purposes.

In fact, the electrical engineer is moving on the coal fields, where the generation of power may be secured without the trausportatiou of coal. There are, of course, many factors in the matter to qualify the prospect of practical success. The suggestion, however, is not without its value, and it may be accepted as a foregone conclusion that enterprise in that direction will sooner or later settle the problem. A scheme has been mapped out for the generation of electric power in the center of the Midland coal fields in England, to be transmitted to the various manufacturing towns of that industrial hive, and so far south as the metropolis. The plau outliued for the geueration of power contemplates the utilization of gas obtained from coal at the mines, aud feeding gas engines of 300-horse power each. If the figures of cost as given are anywhere near the truth, tbc heuefit in au economic sense to the consumer would make the proposed enterprise a commercial success without question.

Blind and Black Frogs.

Hon. A. B. Fall of the Supreme bench hasn't exactly a white elephant on his hauds, but he has something much more curious aud iuterestiug in the sbape of a whole settlement of black frogs, found in his Sunol mine in the Black mountain mining district, uear Las Cruces. He was telling some of his friends about the matter and the facts form quite an interesting addition to the biological history of New Mexico. A number of men, it seems, were sinking a shaft in this healthy gold producer some weeks ago, when at a depth of 190 feet they struck in an underground stream a perfect stratum of small black frogs. Upou examination they were each found to be about the size of oue's thumb, and to be entirely bliud. Another curious fact was that the stream in which they lived was seventy-seven feet below the water level, and upou analysis it was found to contain no organic matter whatever.

The only other points at wbich such frogs have been found are in California and England, aud their existence in the Sunol mine is additional proof that New Mexico is up with the rest of the world in all matters, eveu including subterraueau frogs.

Prof. C. L. Herrick of the Department of Biology, Dennison University, at Grauville, Obio, bas heard of this find and writes to parties at Las Cruces requesting tbat specimens be seut him.—Santa Fe New Mexican.

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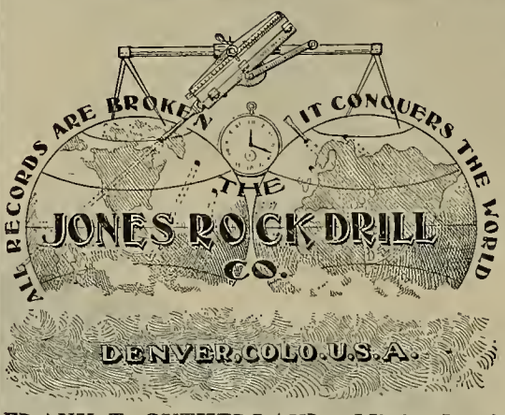

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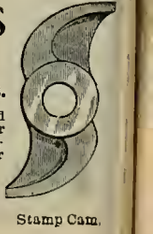
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Cellulose is the tissue constituting the principal fabric of wood. linen, cotton and paper. and is composed of exactly the same constituents as starch. It has long been known that if pure cellulose were treated with caustic soda, or "mercerized," the fibers would swell up. and even when the soda had been washed out thoroughly there would still be a slight increase of weight perceptible. This latter effect is due to the chemical union of one element of water with two of cellulose. For over two years chemists have been carrying on experiments with mercerized cellulose, and, have discovered a number of valuable industrial applications of a derivative of this substance. In their enthusiasm they are inclined to believe that the achievement, which is the fruit of thorough education in chemistry. patient investigation and originality of ideas, will rank with Goodyear's in range and importance. No statement is made of its cost in comparison with vulcanite, ebonite and celluloid, but the properties developed show that the new material is available for much the same purposes as those old ones, while in some respects it is perhaps preferable.

The investigators find that if mercerized cellulose were treated with carbon bisulpbide vapor, the mass would at the end of three hours possess a golden hue, and when dissolved in water form a viscous solution like molasses. After a few days, however, the liquid and solid would dissociate and an insoluble coagulum would result. This latter when well washed and removed from the water hardens into a compact, horny substance, with a specific gravity of 1. 5.

In that condition the new compound makes excellent buttons, tool handles and similar articles. It may be easily colored, takes a high polish, and is very tough. It may be readily turned in a lathe. It also makes admirable insulators. While still in solution the thiocarbonate (or product of treatment with carbon bisulphide) may have some "dehydrating" substance like alcobol added to it. and then it can be drawn out in a fabric of any degree of thickness, from that of a tissue paper to that of veneering. It is as clear as glass, and makes admirable flexible photographic plates. Sheets of it may be stamped into trays, boxes, brush backs, inner soles, book covers and an endless variety of objects, and these can be embossed in elaborate designs at the same operation. As a wash applied to paper in process of manufacture, the solution gives a particularly fine, strong size. Used as a medium for pigments in printiug cotton goods, it makes the colors stick to the fiber. Applied to cloth as a facing, it will serve for upholstery, book-bindiug and even floor coverings, besides forming a good substitude for leather. Cloth having a coating of thiocarbonate will be flexible in washing, but will stiffen when ironed; so that shirt bosoms, collars, cuffs, starched muslins and tablecloths may be made from it advantageously. It is superior to glue, and cheaper, and may be used cold instead of needing to be heated.

Bessemer on Bessemer Steel.

In an article ou the steel industry which bears his name, Sir Henry Bessemer reminds us that a third of a century ago Sheffield steel made from the costly bar iron of Sweden realized from £50 to £60 a ton. Now, by the Bessemer process, steel of excellent quality can be made direct from crude pig iron at a cost ridiculously small compared with former prices, aud in quantities which the old steel workers never dreamed of dealing with at one operation.

Iu lieu of the slow and expensive process of converting wrought iron bars into crude or blister steel by ten days' exposure at a very high temperature to the action of carbon, east iron worth only £3 a ton is, Sir Henry says, converted into Bessemer east steel in thirty minutes wholly without skilled manipulation or the employment of fuel, and while still maintaining its initial heat it can at once be rolled into railway bars or other required forms.

The article gives a vivid picture of all that has been brought about by this revolution in a manufacture in which up to our own time there had been no change since blades of matchless temper were wrought in the forges of Damascus and Toledo. Steel is now adapted to a thousand purposes of which our ancestors had no conception.

By way of giving some idea of the enormous production of Bessemer steel now, Sir Henry asks us to imagine a wall five feet in thickness and twenty feet high, like a gigantic armor plate formed into a circle aud made to surround London. The inclosure so made would contain an area of 795 square miles, and this great wall of London, weighing 10,500,000 tons, would just be equal to one year's production of Bessemer steel.

One of the novel features of a recent military tournament in Eugland was the use of the typewriter on the battlefield for the purpose of recording messages from signalers. It is stated the typewriter operator was also an expert bicyclist, and had his Remington mounted on the handles of his machine. He rode in and out among the horses aud gun carriages without the slightest mishap, and whenever he came to a standstill be instantly braced up tbe bicycle by a handy contrivance and pounded away at the typewriter wbile in the saddle. The message, when completed, was sent to the commandiug officer iu the rear by meaus of a trained dog.

A curious source of wealth is reported by tbe French consul at Mongtze, in upper Tonquin. It lies in wood mines. The wood originally was a piue forest, which the earth swallowed in some cataclysm. Some of the trees are a yard in diameter. Tbey lie in a slanting direction, and in sandy soils which cover them to a depth of about eight yards. As the top branches are well preserved, it is thought the geological convulsion which buried them caunot be of very great antiquity. The wood furnisbed by these timber mines is imperisbable, and the Chinese gladly buy it for coffins.

The Ivanboe tunnel, whicb is ou the poiut of being completed, is cut through the backbone of the Rocky mountains from Busk, a small hamlet fifteen miles west of Leadville, Colo., to Ivanhoe, another little village on the west side of the main range. The tunnel is 9400 feet long, 21 feet high and 15 feet in the clear. During construction the tunnel was lighted by electricity, with an arc light every eighty feet, and several large air compressors supplied fresh air to the workmen. At eacb approach eight compressed-air drills were working, but the amount driven per day averaged only eigbt feet.

A scheme has been proposed to reduce the friction of salt water against the sides of a steamer, whicb, it is claimed, will increase the speed forty per cent. It is to force air through the vessel's plates aud thereby form a narrow space between the iron and water.

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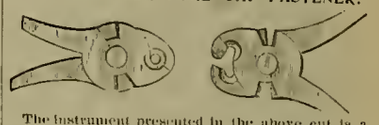
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

Ledger: A. B. Summers and A. J. Crain of Plymouth are opening up a property near the Cosumnes.

Fredric Chisholm of the Extension Mining Company drove a tunuel to prospect the known ledge on their property at the south end thereof. The result was satisfactory and the company is preparing to siuk a shaft.

The Median has been opened to the 200 feet level. The first 100 feet was caved but the second 100 feet was open and the timbers good. They crosscutted to the ledge and are running ten stamps and four concentrators at the South Spring Hill upon good paying ore.

H. F. Vogt has a steam pump throwing water from the Mokelumne river at Dutch Bar into his sluice hoxes and has just commenced to wash gravel which prospects well. He has equipped the property with a boarding house, shops, sleeping houses, etc., and expects to run continuously.

The New London Company has cleaned the shaft out seventy-five feet. They are timhering it temporarily, until their hoist is erected.

The Pioneer mine, Dr. Boyson sole proprietor, at Plymouth, has twenty-six men employed. Ten stamps of its twenty are almost ready to run. The shaft is down over 800 feet and at the lowest level he is drifting north and south on a six foot ledge which is prospecting well. S. C. Higgins has charge of work. The mine is thoroughly equipped and the doctor is very sanguine of its being a great gold producer.

The Bay State company is still sinking and will continue till they reach 640 feet. At 600 feet they will open up the ledge and start their mill. The sinking is heing done hy contract. Work has beguu on the new mill the iron work of which has heen let hy contract to the Fulton Iron Works. A new pipe line will have to he laid 2500 feet which will give them a fall of 323 feet.

El Dorado.

FROM INDIAN DIGGINGS.—Amador *Record:* Five or six Amador county practical mining men have heen at work on the extensiou of the old Volcano mine, and are meeting with good encouragement. They are sinking a shaft to strike the channel. They have cut through a hed of lava cement and are now in secondary river wash, which gives evidence that a large volume of water flowed through the channel. It is thought that hedrock will be reached in a month or so, wheu the work of crosscutting the channel will he commenced in order to ascertain its width.

The Plymouth Cousolidated Mining Company at Indian Diggings are running a tunnel to gravel hed to ascertain whether it will pay to ground sluice and open up a cut to it, so as to hydraulic it. The company receutly struck swelling ground in the tunnel, which has delayed progress some, as it has necessitated retimhering a portion of the tunnel.

Mr. Williams, who honded Mr. Cope's claim, is preparing to commence work. He will run a tunnel for the purpose of tapping the river channel by hydraulicking the other portion of the claim.

Mr. Leopold is doiug well with his new prospect. He has a good ledge of $20 rock. He is using an arrastra to workthe rock. His last week's run amounted to four and a half ounces, a very good showing for the work of two men, especially as the rock had to be sledded ahout one-fourth of a mile.

Nevada.

THE SPANISH MINE.—*Transcript:* The shaft at the Spanish mine in now down 175 feet, and is to be sunk 100 feet deeper, it being the intension of the owner to thoroughly exploit the mine and work it in a systematic manner. Splendid rock is being taken out right along and the mine never looked hetter than it does at the present time. We understand the shaft is to be enlarged so as to allow a double track for cars. At present there is hut one traek in the shaft. This arrangement will greatly facilitate hoisting when the mine is opened sufficiently to permit of more extensive work underground.

It is ahout a year ago since A. R. and Atherton Lord sold the Spanish mine to the company now operating it. The price was $55,000, of which amount $25,000 was paid down. The last payment on the property was made yesterday. More than enough money to pay for the mine has heen taken out of it during the past year and the output for the ensuing year, it is expected, will greatly exceed that of the last twelve months.

Plumas.

BIG PROSPECT STRUCK.—*National Bulletin:* A note from Mohawk informs us that on the 9th inst Walter Scott struck a rich prospect in a ledge at the head of Rhoads' Ravine, Mohawk Valley. He ohtained as high as two dollars of coarse gold to the pan. Messrs. Scott, Canisty and Carothers are developing the find at present.

Fully $30,000 in placer gold in years past has heen taken out of two gulches fed hy the ledge just struck by Mr. Scott. This is a gold region. As much gold has been taken from the placer mines helow, reasonahly certain it is that Mr. Scott has struck the source of the rich gravel.

San Diego.

THE OGILBY DISTRICT.—"The gold mines of eastern San Diego county are destined to astonish the world," said D. M. Duhray to the *Union.* "I have just returned from Gold Rock camp in Ogilby district, and the people of San Diego do not imagine what a treasure they have in their own county. The mines in that district, I verily helieve, on my own opinion and that of every mining man who has seen them, will become the greatest gold producers in America, if not in the world. Such immense deposits of ore are rarely to he found anywhere, and when you add to this the fact that the ore is of high grade, running not less than $10 per ton, you can imagine the honanza in sight. The deepest mine in the camp is 300 feet down, and not another foot needs tc he sunk to keep a hundred-stamp mill running for the next three years. Neither wall in this great orc hody has been found—in fact the ore seems to he more of a deposit than a vein, though I have no donht that the formation is regular and that the gigantic veins will he found to run with the trend of the Cargo Muchacho mountains in which they lie.

"The Golden Cross Mining and Milling Company is owner of the properties worked at present, the main mine being the Golden Queen in point of development. Thirty men are at work in the mine, and seven men break enough rock to keep the forty-stamp mill going night and day, crushing 120 tons. One man develops enough ore to keep fifty men husy. Some of the hig stopes in that mine would easily contain the higgest huildiug in San Diego, if not quite the Hotel del Coronado. Two hundred and fifty people are in the camp and the population is rapidly growiug. Other companies are hecoming interested and more prospects will soon he developed, with every indication that they will he as hig as the Golden Queen.

"For years these gigantic deposits were deserted, and Eastern capitalists laughed at the reports made on them, deeming them lies and impossihle of fulfillment. Then the Hedges hrothers and a couple of other Los Angeles men went in, and hy hard work, economy and daring they got the properties developed, piping water from the Colorado, twelve miles distant, and erecting a forty-stamp mill. Within a year they had iu sight a greater property than anything in South Dakota, greater thau the Treadwell in Alaska, and perhaps the best all-round gold property in America. Everything seems to favor the camp. The ore is appareutly of all kinds and colors, yet it is all free milling. The gold is as good as reaches the San Francisco mint, reaching $20 per ounce. With all these things the Englishmen hegan to get interested, and they offered $1,000,000 for the properties; but it was the Americans' turn to laugh, and they would not entertain the offer. The Hedges own three-fifths and other parties the balance, and all efforts to buy into the company have failed. I helieve that within two years the mines will be worth in cold cash $5,000,000.

"The district," continued Mr. Duhray, "is a big one, and the mountains seem to be full of ore as promising as that on which the Hedges are working. Mining men are puzzled when they come to look at the district, as in many features it is an entirely new problem in geology and mineralogy. All agree, however, that the district will astonish the world with its yield of gold. The Golden Cross Company will increase its stamps to 80 and later to 100, and with other companies going in there will he greater activity and an immense camp built up. The camp is four miles north of Ogilby station, on the Southern Pacific.

Shasta.

WHISKY CREEK MINING DISTRICT.—*Courier:* The quartz mining interests of Whisky Creek mining district have received this past spring and summer an impetus that is not only of considerable importance to the State hut encouraging to all who feel an interest in the miuing welfare of Shasta county.

The old West End mine which a short time ago passed into the hands of mining men of some capital, and which has heen under the management of D. Hunt, has heen sunk to a depth of 100 feet, showing a sufficient amount of high grade ore to warrant the projeetors in further developing the mine hy way of tunneling into the mountain on the ledge and to this end a contract was given a few days ago to Hunt by A. James, an old mining and mill man of considerahle capital. This mine, like the Gold Dust mine, lately purchased hy Lyson, Walters & Co., is situated in close proximity to Stella. Mr. W. & Co. lately clcsed down on their mine for the purpose of prospecting their mining property further north. This Co., we are ereditably informed, will resume work early this fall not only on the Gold Dust hut on several other mines which they have contraeted for in this section. This latter company, like that of the James and Hunt company and several others we will shortly mention, are men of energy, means and intelligence, and understand their business, and it has passed heyond the question of a doubt that success awaits them in the near future.

The Mad Ox mine, so well and favorahly known, is heing further developed every day hy a force of energetic miners hacked by O. P. Woodward. Late developments in the 1600 foot tunnel show that there is quite a large and rich deposit of free milling ore existing still in the old Mad Ox, and it is safe to predict that the grand and popular mine will ere long pass into the hands of mining men of means and again the steam whistle will be heard in the deep confines of rugged mountains near the head of the old Whisky Creek.

Mr. Hetchell's arrastra, near the Whisky Creek hridge, is being run night and day on very high grade ore and Mr. H. is doing well and the indications are that his old Pine Top mine will bring him out on top. His ledge is rapidly increasing in richness and in size, and it is the wish of everyone in this vicinity that he may make himself independent, for he is a very deserving and hardworking citizen.

A Denver company has lately secured several patents of mining claims on and around Dog Gulch, and mining matters in that vicinity are quite lively and exciting.

Passing north in the neighhorhood of Iron Mountain, Messrs. Martin, Davis and Record have done a grand work in the way of development on several promising mines and they will either sell, or construct reduction works themselves this fall, and he prepared to commence crushing quartz ere the fall rains begin.

A BIG ENTERPRISE.—*Examiner:* Hugh McDonnell of Chicago, who was one of the leading mine-owners of Leadville during the palmiest days of the carhonate excitement, has just completed a thorough examination of the Iron Mountain mine, Shasta county, for a New York syndicate, and says he has, as the consulting engineer, recommended its purchase, and has no douht the syndicate will take it.

"The price I do not feel at liherty to state, but it is several hundred thousand dollars. We will erect a large smelter there capahle of treating 250 tons of ore a day, and will employ in it and the mine several hundred men. The mine is a very large one and has an enormous hody of ore exposed, which runs $41 a ton in gold and a large amount of copper and lead. The ore will he reduced to a mat, not bullion, and will then be shipped.

"There is already 2250 feet of development on the ore hody, too. This is aside from other tunnels and shafts that do not yet reach the ore. There are 360 acres in the mining claims. Besides this there are 740 acres more of timber adjoining, making in all 1200 acres. The persons from whom we are buying are Charles Camden of Oakland and James Sallee and Mrs. Colonel Magee of Shasta. The Iron Mountain is four miles from the California and Oregon railroad and ten miles from Redding. We shall work it on a large scale."

At French Gulf, the Gladstone mine, owned hy Cleveland, Ohio, people, is running a thirty-stamp mill and a chlorination plant. The vein of this mine varies from four to twenty-six feet in the fissure hetween the walls. It is one of the most remarkable producers of the county. The Washington mine has been producing steadily for thirty-five years in one fissure. Adjoining this is the Niagara, formerly owned hy William T. Coleman of San Francisco, who made and spent three immense fortunes on it. Adjoining it is the Tom Green mine, named after its owner, and the Scorpion and Myers mines, both of them private properties. None of the owners can be approached in any way. Each is averaging about $50,000 a year net and knows a good thing when he sees it. The Old Diggings district, on the east side of the Sacramento river, ten miles from the county seat of Shasta county, is a very interesting one. The Walker Brothers of Salt Lake City operate a miue which they call the Utah and California. It was formerly a large producer and yielded the owners many times what an ordinary man would regard as a fortune. The Walker Brothers are now developing an "upraise" from a deeper tunnel, which they have just completed. The vein they are working will average from ten to sixteen feet in thickness, and will yiold $18 a ton for an indefinite period.

Sierra.

MINING DEVELOPMENTS.—*Messenger.* San Francisco capitalists are negotiating for the Wm. Tell ledge.

Parties from San Francisco have two men prospecting at the Mountaineer ledge with a view of purchasing.

It is rumored that the Sierra Buttes Company intend to negotiate for the purpose of the Keystone and the adjoining ledges.

Four men are at work on the Young America tailings. More arrastras will he put up soon. The recent cleanup was satisfactory.

No work is heing done at the Colombo. The huildings, etc., have heen purchased hy the Phœnix company and are heing takeu to their mine.

Six men are working on the Clevelaud ledge, ten at Chips and five on the Salinas and Mercer where a new ditch is being put in several thousand feet in length, J. E. Freeman superintending the work.

Parties have heen up to look at the Comet ledge at the head of Jim Crow canyon. Three ledges ahove run into one helow, thirty feet in width, twenty-five of which pays $4 to $5 a ton.

The Sierra Buttes company has recently increased its working force up to twenty men, and their ore is hetter paying than four years past. Steve Thomas still officiates as superintendent.

About eighty men are husy at the Bonanza mine. The rock is very rich and is crushed in a forty-stamp mill, run hy water power and lumber is coming for the huilding. The cleanup for last month was $15,000.

S. W. Langton, R. Sharkey and L. Thompson are prospecting at the Sacred Mount ledges, now called the Buttes Extension, Nos. 1 and 2, between the Saddle Back and Sierra City. The tunnel is in 359 feet, with good-looking ore ahead.

Gladie mining company, operating at the Phœnix ledge, is replacing the old iron with new steel rails in the mine, and preparing a station inside for an electric hoisting plant, costing $3,500, to continue sinking and, also, illuminate the works and Sierra City with electricty. Thirty-eight men are employed. Under the able management of Supt. W. T. Stanley the property is being advantageously developed.

Siskiyou.

MINING NOTES.—*Journal:* Marion Freshour was in town yesterday, and brought a big fat sack of gold dust from the Benz Bar mine on Klamath river, near Honolulu. This claim is the hest paying mine on the entire Klamath, and will continue to help out the gold market very materially until the winter storms stop operations.

Tho pay channel having heen lost in the Beehe Bar mine, Klamath river, now under the superintendence of A. Smith, a drift was run across the river basin, which resulted in finding the pay channel, that yields good prospects. All apparatus will he moved so as to reach the new spot, with good prospects of taking out considerable gold before winter sets in.

The McConnell & Quinne claim is lying idle this season, owing to the high stage of the river, which is still one and a half feet above low water mark, with no prospects of getting any lower, this claim not being workable nuless the steam reaches low level of the average seasons. The river was four feet above low water mark for ahout four months, owing to the great amount in the Klamath lakes, from which it is fed, together with an unusual quantity of snow on the mountains. The claim is leased hy Dr. Songer and Messrs. Watson and Dame, of Ashland, who have $3,000 worth of machinery at the claim, with expectation of working it next summer. They have a three years' lease, with privilege of two more.

All the claims on the upper Klamath, ahove Shasta river, are reported as paying well, especially those in the Ash creek section.

The Schroeder quartz mine at Deadwood is paying well at present, with the mill kept running steadily every day and night.

NEVADA.

Kennedy District.

THE IMPERIAL MILL.—*New Era:* The mill is reducing hetween sixty and seventy tons every twenty-four hours. There are two great advantages, which are hut exceptionally met in mining camps, namely, the great capacity per stamp and the easy working of the ground in the mines. The Manhattan mill, in the famous camp of Austin, had a capacity of a little over one ton; the Imperial ranges from three to three and a half tons. The average cost of mining a foot of ground is $10; in Kennedy the average is $2 to $3, which means that the cost of extraction and milling in Kennedy should he from one-half to one-third of the average camp, other things heing equal. Even in the matter of fuel, Kennedy is favorahly situated, the company getting pine wood delivered at $5.50 a cord. The ores are not roasted, but are reduced hy the simplest process known to millmen—plates and concentrators—aud since the first partial cleanup, after a week's work on oxide and sulphurets, has demonstrated its success, it is with pride we give to Kennedy the name of "Imperial" over any camp in the State, the present Comstock not excepted, and join with our citizens in proud mentioning.

OREGON.

The L. Sisley placer claims, known as the Jordan ranch, on Burnt river, have been honded to a Utah syndicate represented by a Mr. Holmes. It is the purpose of the new company to equip the mines with machinery. A pump capahle of raising 200 inches of wator 200 feet will be put in place.

Josephine County.

PROGRESS OF DEVELOPMENTS.—The Anaconda mine on Williams creek, at the depth of 100 feet, is showing a fine body of ore for a distaure of seventy feet in the new drift. This proves the chute to he 200 feet in length and the vein from one to four feet wide, which will mill $15 a ton in free gold. A large Huntington mill will soon take the place of the arrastra uow in use.

The Bone of Contention has been sold to F. A. Huntington et. al. of San Francisco, who will start to work at once fitting up the eight-stamp mill with new mortars, enlarging the apron service and making such other changes and improvements as the increase of force on the mine will demand.

The Mountain Lion Co. are building a road to their new claim—the Mountain—which has encouraged its owners hy showing, at the depth of fifty feet, four feet of free-milling ore that will mill $50 to the ton. This, worked in connection with the Mountain Lion, which discloses in its lower levels two feet of even a higher grade concentrating ore, will tax the capacity of the large five-stamp plant to its utmost, though run continuously.

Rich rock has been found on the hillside below the once famous Jewett mine, which seems to he a feeder that will lead to another rich chamber of ore, like the one that was worked out in early days. The chambers have been known to occur at frequent intervals in other mines of this peculiar character, and there is no reason why this will not prove the case in the Jewett, as the development work is paying a handsome profit.

The Hammersly mine continues to contribute its usual amount to the only circulating medium. The tunnel is in a distance of 400 feet, which crosscuts three other veins besides the Little Daisy, which startled old-timers with its richness from top to hottom of the sixty-foot shaft, which is tapped by a thirty-foot upraise from the tunnel. With the exception of some ore stoped from a level with the bottom of the sixty-foot shaft on the one vein, it is still in the mine, which leaves ninety feet of ore above them.

Jackson County.

GOLD SPECIMENS.—*Tidings:* Hon. Theo. Cameron went north last evening with the mineral exhibit to the State Fair. He had with him a hundred ounces of choice specimens from Beekman & Reames' hank and fifty ounces of nuggets from the Sterling mine. Had he known it in time, he could have procured a lot of nice specimens from the Sturgis mine and from his Galice Creek mine and from many other large claims in the district. The gold which is taken out of the mines is generally shipped directly to the Mint, and unless a specimen is a curiosity in some way it is not presented. He had hut a small quartz exhihit on account of the fact that the large numher of specimens saved from the rich finds for keepsakes were crushed under the pinch of the money stringency and couverted into cash to meet current demands. The notice was too short to prepare such an exhihit as our mineral resources would warrant, but Mr. Cameron carries with him what will be likely to prove the drawing card of the pavilion.

WASHINGTON.

SQUAW CREEK DISTRICT.—Squaw Creek is situated about forty miles from Ruby, and

twelve miles from Silver, and is a tributary of the Methow. Considerable work has been done in the district, it is said the ledges are well defined, and there is hardly a prospect from which gold cannot be panned. The lack of capital however has kept the district back, but now there seems to be some effort to bring the camp out. A gold mill has recently been received and put up on the "Golden Wave." Several parties with means have paid a visit to the camp, to investigate the reported rich placers; the high water however prevented thorough exploration, although working on the high bars is carried on with a fair degree of success.

Charles Ostenberg is building another arastra which will make the third one so far erected. There is a large amount of free milling rock on the surface which can be handled successfully by this means.

BOUNDARY CREEK.—Samples of Skylark ore from the fifty foot level were assayed in Butte last week and returned 354.4 ounces of silver and $26.40 in gold per ton. The miners have broken into ore on the seventy foot level of the Providence, the average width of the rich vein being about six inches. The ore carries 1,690 ounces of silver and $6.40 in gold per ton. Work was resumed on this property a few days ago.

BRITISH COLUMBIA

KETTLE RIVER.—*Advance*: As in other mining sections of British Columbia, Americans are getting hold of all the best mineral properties in Kettle river a few exceptions, of course, excluded. We must give our neighbors across the line credit for a great deal more enterprise in mining operations than the people on the British side.

NAKUSP. *Ledger*: Wages are not as high at the Silver King mine on Toad mountain, as they are in the Slocan. Miners on that property receive $3.00, and laborers $2.50 a day.

IDAHO.

WILLOW CREEK DISTRICT.—One of the richest gold ledges ever opened up in Idaho is located in the Willow Creek district. It is at present held by D. B. Levan of Caldwell, but in view of the fact that he relocated it and that the development he has done has shown it to be of such great value, there will likely be a bitter fight before the ownership question is settled. The ledge, which is a decomposed formation, has been uncovered for a distance of 300 feet, and its average width has been found to be two and a half feet.

Chunks of the ore have been taken indiscriminately from the ledge and pounded up in a small hand mortar. In seven hours $7 in gold was cleaned up by this method. It will assay between $1500 and $2000 a ton.

Messrs. Robertson and Pritchard are running a tunnel on the Red Warrior, which will tap the ledge 300 feet deep. The tunnel is now in about 100 feet. The surface ore is free milling, assaying $40 a ton in gold.

The tunnel on the Sheldon and McDonald mine is in 130 feet. The ledge will be tapped in about 150 feet farther. The ledge is large and the ore assays from $75 to $100 a ton, the gold and silver being about equally distributed.

The district will shortly have a five-stamp mill in operation. The mill has been ordered by Mr. Carter and will soon arrive.

A move is on foot to consolidate all the principal claims in the district and sell them to San Francisco capitalists. About thirty claims are in the proposed deal.

GETTING MONOTONOUS.—*Avalanche*: Another strike in one of the Bryan groups in Owyhee was reported by telegram yesterday. This thing is getting monotonous. Those confounded tenderfeet come here and find several paying mines, while we old-timers are letting the moss grow on our backs.

MONTANA.

THE GOLDEN SUNLIGHT GROUP.—A. H. Hoadley, the original owner of the Golden Sunlight group of mines, is an old Montana miner and has been prominently identified with the mines of this State for the past seventeen years, chiefly on the Pipestone and in the Summit Valley mining district in its infancy. Two years prior to the discovery of the Hoadley group, now called the Golden Sunlight, he was working his lead properties in the vicinity of the mines which so soon made his name famous, but he became involved in litigation with the Northern Pacific Railroad Company as to its right to mineral ground, and as this was a test case it remained in the courts after having secured decisions in two other cases on appeal. Having some knowledge of the Golden Sunlight group and learning that they were owned by a miner working in the placers in the Highlands, he went there and purchased his title, and on the 25th day of March, 1890, he relocated them. From that day the property has been extensively operated upon, says the Basin *Times*.

The American Mining and Developing Company bonded the properties for $500,000. Hoadley received his $25,000 down in cash at at the expiration of his bond. The American Mining and Developing Company, in proving up the properties, sunk a shaft 200 feet and ran 1800 feet of drifts and tunnels and then made a sale of them for $500,000 to another company.

The present company is now building a 180-ton concentrator, which is fast reaching completion. It is about a mile and a half from the mine, with which the company will connect by an endless cable with buckets, and this will be the manner of transporting their ores to the concentrator.

Five cars of ore, shipped by the American Mining and Developing Company before the mine came into the hands of the present management, netted them between $600 and $700 per car, and the present company made a shipment of a number of cars that netted them handsome figures. The lead crops out prominently on the surface and can be traced a considerable distance, but in depth the pay is found in large deposits and not in regular chutes, as is found in many large mines, but more similar to the deposits found in the Alta mine near Wickes.

WAGES RAISED.—*Inter-Mountain*: The scale of wages under which the miners of Basin have been working ever since mining became an industry in that district has not been up to the union rate as paid in Butte. They have received $3.50 per day, but the carmen and shovelers got less, and on night shift they worked full ten hours with an eight-hour shift on Saturday nights. After some little discussion by the union it was decided to make a demand for a raise, which was done, and after several meetings, in which the directors of the Hope figured prominently, it has been agreed that the night shift will work but nine hours, and eight hours on Saturday nights, the day shift to continue working ten hours as usual for the seven days in a week, and all hands below are to receive the same wages of $3.50 per day.

UTAH.

BINGHAM DISTRICT.—*Tribune*: The Stewart mill, Bingham, has been closed down for a few days to clean up and make some repairs, but it will soon be in operation again. For a time it has been operated by day shift only, but the run will soon be continuous. Gold bullion has been produced right along and sent to market.

WYOMING.

WYOMING PLACERS.—Regarding the placers of Carbon county, Wyoming, and Routt county, Colorado, a newspaper correspondent speaks of large tracts that canals might cover that he knows from prospecting with a pan that would run from $3 to $10 or $12 to the cubic yard. Miners at those points say that if he had said from 10 cents to $2 or $3 to the cubic yard he would have been nearer the mark, and to do this it takes plenty of muscle and the burlap and punctured steel plate process to make it pay. Canals are being surveyed, and probably considerable work will be done on them this fall. No dry washer yet invented is of any use there. Punctured steel plates and the burlap system are the only processes that will save all the gold. The Mapleton Company had just got their works in good running order on Smoke river, below the mouth of Big Hole, when a tremendous cloudburst occurred up the gulch from which they were completely "knocked out" for the season, losing their claim and one good bar of sand and gravel that would run from 50 cents to $2 to the cubic yard. This company will resume work as soon as practicable.

ARIZONA.

SILVERY MOHAVE—Kingman *Miner*: From agent Tarr, of the Atlantic and Pacific railroad, and from the local samplers we learn that for the eight months of 1894 there has been shipped from Kingman station to eastern smelters 1436 tons of ore valued at 574,400 ounces in silver and 6464 ounces in gold. About 386,000 ounces of this amount was shipped through the two samplers here and the balance was shipped direct by the producers. Besides this there was shipped through Wells, Fargo & Co. express $7961 in gold and 23,972 ounces silver bullion. The silver bullion carried enough gold to bring its value up to one dollar per ounce. The product for the eight months is as follows, averaging silver at 63c. per ounce:

574,000 ounces silver @ 63c.	$361,620
6464 ounces gold @ $20	129,280
Gold bullion	7,961
Gold and silver bullion 23,972 oz.	23,972
Bullion sent from country by carriers	5,000
Total value in dollars	$527,934

Eighteen carloads a month from Kingman is a big showing from ore shipments these dull times and the exceeding richness of the ores make the shipments all the more remarkable. The dust sweepings at the two samplers for months past show an average value for the ores worked of 400 ounces in silver and four and a half ounces in gold per ton. Formerly these sweepings showed an average of only 132 ounces in silver and one and a half ounces in gold. The low price of silver has forced chloriders to assort their ore to a higher value than formerly, and at the same time the ore chutes are far richer than any heretofore discovered in Mohave county. Let us hear from any county in Arizona that can make a better showing than this.

COLORADO.

THE TOMBOY.—The Telluride *Journal* says that the Tomboy Mining and Milling Company shipped out a retort this week weighing over 350 ounces. This company has recently purchased a lake in Imogene basin, just across the range from Savage basin, and will put in heavy pumps and pump the water over the range and into the mill, which will be used for milling purposes. This will insure a large supply of good water all the year around, and will add much to the already valuable plant. The pumps will be operated by electricity at a nominal cost.

AMETHYST MACHINERY SHIPPED.—The machinery for the Amethyst mine at Creede to replace that destroyed by fire was bought in Leadville and has been shipped. It consists of three carloads of second-hand material secured from several closed mines in the Leadville section, besides a number of air drills and compressors used in the construction of the Busk-Ivanhoe tunnel.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

Coast Industrial Notes.

—The Parnfline Paint Co. has declared a dividend of 25 cents a share.

—The Midwinter Fair managers think they will have a financial report ready about November 1st.

—It is expected that regular trains will be running between Bonsou and Bisbee, Arizona, by the 10th of October.

—The entire Oregon wool clip for the year is estimated at 18,000,000 pounds, with a value at six cents of $1,080,000.

—The log raft at Astoria, Or., to be towed to this city, has a capacity of 7,000,000 feet logs, decked with 475,000 sawed lumber.

—Thirteen shingle mills have gone into the hands of receivers in the State of Washington this year, six burned and eight new ones built.

—At a cost of $1.09 per linear feet the Oakland Water Co. is building a 2000-foot trestle to carry its 30-inch main pipe across the low land near Alvarado.

—The *Lumberman* says there is no change in the price of logs on Puget Sound, although the demand is better than at any time during the past twelve months.

—Foreign lumber shipments from Puget Sound during August aggregated 12,482,000 feet of lumber and 1,170,000 shingles. This was the heaviest month for some time past.

—The Corvallis, Or., carriage and wagon works are to be sold to an Eastern syndicate. The local shareholders have lost $50,000 in the enterprise. It is expected the new owners will employ 100 men.

—It is asserted that a new steamship line, the vessels to be built in England and to sail under the Mexican flag, is to be established between Panama and this city to connect with the newly completed Tehuantepec railway.

—The American Pine Needle Manufacturing Company has incorporated in this city. Capital stock $1,000,000. The company will engage in the manufacture and sale of oils and extracts from native woods, use the bark of trees for manufacturing purposes, etc.

—Thirteen California redwood slabs, each nine feet wide, four feet long and five inches thick, have been shipped to England to be used in the manufacture of pianos and cabinet work. They were sent from the Occidental mill, this city.

—Another rich oil well was tapped within the limits of the city of Los Angeles this week, at a depth of 1100 feet. The present output of that particular oil field is said to be 500 barrels per day. The flow of gas from that well is the heaviest of any yet in that section.

—Lumber freights from British Columbia or Puget Sound are quoted as follows: Valparaiso, for orders, 35s; Sydney, 37s 6d; Melbourne, Adelaide or Port Pirie, 36s 3d to 37s 6d; United Kingdom, calling at Cork for orders, 45s; Shangbai, 45s asked, 42s 6d offered; Tientsin, 55s; South Africa, 60s; Noumea, 40s.

—The Monterey will not make the test of Puget Sound coal, as was intended, being unfitted for doing so satisfactorily. Using no natural draft, considerable risk would be taken of burning out the uptakes when testing. It is probable one of the Bering Sea fleet, now arriving on the Sound, will make the trial.

—The Coquille (Or.) *Herald* is reliably informed that the Bandon Canning & Mercantile Co., recently chartered and locally represented by Geo. W. and J. F. Williams and Geo. M. Dyer, of Bandon, together with some New York men, have invested $1,000,000, and have had bonded to them all the sawmills on the river from Coquille City down to Bandon, together with all their timber lands and belongings; also coal lands on both sides of the river, and intend to erect a cannery and large sawmill at Bandon.

—Extensive coal deposits have been discovered about twelve miles from Bartles, on the McCloud river, Cal., embracing ten square miles of territory. Several claims have been taken up. The coal is of a good quality. Work will be commenced immediately toward developing the new find and will consist of several tunnels and shafts. A wagon-road will be built from Bartles to the site at an early date, and if surface indications amount to anything, the coal deposits are something great. The coal is bituminous and burns very freely, having little or no shale in its composition.

—The following assessments have been levied on southern California local enterprises and fall due on the dates named: Azusa Irrigating Company, Los Angeles county, 20 cents, 20th October; Occidental Mining and Petroleum Company, Santa Barbara, 10 cents, 15th October; Lugonia Water Company, Redlands, 90 cents, 6th October; East Redlands Water Company, $3, 10th October; Crafton Water Company, Redlands, 10th October; San Felipe Land and Water Company, Los Angeles, 60 cents, 10th October.

—Charles Hansou, the president of the Tacoma Mill Co., Tacoma, Wash., says: "The men who own large timber tracts in Canada are the men who secured the removal of the $2 per 1000 duty on lumber. I have met many of them, and they have told me off and on during the past four years that it was only a matter of time when they would get this duty removed. The advantage of the foreign lumber shipper on this coast over the American is great, now that the tariff has been removed, for three reasons. the principal one of which is the ability of the foreigner to ship lumber in foreign bottoms to American ports, thus saving from $1 to $3 per thousand, according to the distance. Sailors aboard foreign ships are not as well fed or as well paid as our sailors. We pay our captains from $140 to $150 per month, while the captains aboard Norwegian ships receive from $45 to $60 per month. Their sailors receive about half as much as ours. Our men get $30 per month, and as a rule receive a pound or two of beefsteak a day, and are allowed butter with their soft bread. Their expenses being so much less, they can handle lumber cheaper. They can take lumber from British Columbia to New York or Philadelphia, while we can charter only American vessels to carry lumber to ports in our own country."

—The advisability of using steel in the construction of dams has long been urged by civil engineers, and the experiment will soon be tried in a dam across the Santa Ana river. This dam will be 100 feet high, and it is expected that it will cost about $80,000. The foundation of the dam will be made of steel tubes imbedded in the solid rock of the river. The face of the dam will be made of plates riveted together and painted to preserve them from rust. Some of the advantages which steel is claimed to have over stone masonry in the construction of dams are that it is cheaper, more quickly constructed and less liable to be injured by the effect of earthquakes. If the present experiment proves a success, steel will doubtless largely take the place of other material in the construction of dams.

—The cargo shipments from Puget Sound mills, Washington, for August aggregated 33 cargoes—19,478,585 feet of lumber; also 875 piles and 47 spars from Port Blakely mill; 709,000 lath and 55,000 pickets from the Puget Lumber Co., Port Gamble, and 732,000 lath from Tacoma Mill Co. This does not include the shipments from the Stimson Mill Co., Ballard. The lumber cargoes were shipped as follows: From the St. Paul & Tacoma Lumber Co., 3; Tacoma Mill Co., 7; Puget Mill Co., 5; Washington Mill Co., 4; Port Blakely Mill Co., 14; total 33, destined to the following ports: San Francisco, ten cargoes, 6,044,664 feet; other California ports, nine, 3,911,633; South America, seven, 5,064,288; Sydney, N. S. W., two, 1,421,000; South Africa, one, 1,880,050; Suva, Fiji, one, 517,000; Honolulu, one, 635,000; Port Pirie, Australia, one, 905,000; Mexico, one, 447,338.

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Electrical Progress.

C. B. SESSIONS, of the Electrical Engineering Co. of this city is putting in a big electric power plant at the Empire mine, Gold Valley, Sierra Co. It includes one 150 H. P. generator and two 60 H. P. motors, furnishiug power to an air compressor and 30-stamp mill.

During the week electric cars have begun to run on Mission street.

Adolph Sutro's proposed electrie road to the beach is taking tangible shape. The preliminary survey has been made and au easy grade determined.

Describing the electric plant at the Bodie mine, Superintendent Leggett says: "The entire cost of this plant does not exceed $38,000, while its operation during the month of October alone effected a saving of $2100, equivalent to $1.46 per ton of ore crushed, and reducing the total milling cost to $2.32 per tou; a fairly low figure for a high-priced camp (wages $4 per day) such as Bodie. At present the plant is operating most smoothly, and is successfully demoustrating the effectiveness and simplicity of the siugle-phase synchronous system for such work and distances." The daily saving ou twelve-hour runs is stated to be from $35 to $40.

The San Francisco Electric Light Co. have the contract to furuish Berkeley 50 arc lights of 2000-candle power each for $9.50 per month. The contract is for four years.

Dunsmuir & Sous, the East street coal men, are about to put in an electric coal carry from the vessel to their yard.

A big reductiou in the price of electric lights is reported from Los Angeles.

The work of cutting the electric roof wires goes on on the part of the city. Chief Sullivan says it will continue till the work is completed, or he is stopped by an injuuction. The Edison people are rearranging the wires as fast as cut. They propose to string their arc wires, the conduit system being used only for incandescent wires, any attempted application to the entire circuit resulting iu loss of current. The other two compauies are said not to possess the requisite municipal right enabliug them to place their wires on poles.

The Folsom Water Power Company expects to have considerable to do with long-distance electric power transmission in this State. It has a stone dam on the American river at Folsom 89 feet high, built of grauite. The reservoir is three miles long, holding about 13,000,000 gallons of water, supplying a canal 50x40x8 feet, with a flow per miuute of 85,000 cubic feet. With this it is expected to generate electrical power in Sacramento, nineteen miles distant. This matter of lighting the State capital has been sublet to the Sacramento Electric Power & Light Company. The canal now building will be finished in April, '95, at which time the machinery is also expected to be in place. There will be four pairs horizoutal, cylindergate special turbine wheels, having 2520 H. P., with a 55-feet head, and two electric generators, each of 1000 H. P., will be used. The engineers in charge calculate that 80 per cent of the power thus developed can be successfully transmitted to Sacramento by heavy copper wire strung on poles.

The problem of long-distance transmission of electric power has been given affirmative argumeut iu the Niagara Falls euterprise. Electrical engineers whose reputations make their opinions of value say that it is feasible to thus transmit electrical power without noticeable leakage nearly 300 miles. The cost of coal makes the question an important economic one to San Francisco. It is now confidently asserted that power can be developed at the Mt. Diablo coal miues and successfully transmitted to this city—a little over 50 miles. Cheaper still is the great unused flow of the mountain streams of the State, which on their sunny slopes have many fine sites for dams and whose course to the sea presents a great opportunity to couvert the momentum of the current into electrical power to be applied to mining. The question of successful reduction of ore is an important one to the mining interests of this State, as on the cheap processes depends largely the successful treatment of millions of tons of low-grade ore. The time when rock that ran less than $15 to the ton could not be profitably worked belongs to a past era. Electricity is the potent force that will reuder profitable many of the foothill and mountain mines uow idle.

Electricity is having considerab'e to do with a preseut proposition to vacate the San Quentin penitentiary aud consolidate that penal institution with the one at Folsom. At the latter place the State has possessory rights that give it control of good H. P. from the electric plant now being established. This is in perpetuity, and can furnish it all time, at the minimum of expense, power sufficient to light the institution, and a reserve for machinery should convict labor be utilized as proposed.

Electric Energy.

All the existing electrical conveniences supplied by wire into houses are, excepting telephonic communication, delivered as energy. If the electricity be supplied for driving a motor in the house, the performance is evidently an amount of mechanical work such as would be represented by raising a given mass of matter through a certain height, and capable, therefore, of being reckoned in foot pounds. Or, if the electricity be employed for culinary purposes in an electrie stove, the supply ean be rated at the amount of water which would be raised through a giveu range of temperature by all the heat electrically developed, this water heating being also capable of expression in terms of mechanical work. Less obviously than this, but no less certaiuly, says a writer in *Cassier's Magazine*, if the electricity be supplied to incandescent lamps, it is heat once more, expressible in foot pouuds, that is developed in the carbon filaments, raising their temperature to that of brilliant incandescence. To supply motors, stove or lamps, electric generators in the supply statious have to be revolved against magnetic forces by steam engines, and hungry furnaces under their boilers must be fed with the coal which is our present great stock of petrified solar energy. Were our methods and machinery of transformation and transmissiou ideally perfect, the sum total of all the foot pounds delivered in the houses would equal the heat known to be latent within the coal consumed. Under the best working conditions there is an enormous disparity betweeu the sides of this balance sheet. Heat streams off and leaks everywhere through boiler walls, chimneys, pipes, valves, cylinders, journals and electric wires; so that, of the theoretical energy in coal, less than ten per cent is available to the consumer in heat or motive power under the conditions of recognized good practice.

THE *Electrical Engineer* has made au investigation of the cost of installing, operating and maintaining municipal electric light plants, and concludes in favor of electric lighting by private enterprise as opposed to a city's engaging in the work of furnishing its own light. Results shown by the operation of about forty plants point to cheaper operation by private companies. When the latter are placed on a parity with the muuicipal plants as to taxation, etc., they are able to supply a town with light as cheaply as it can supply itself.

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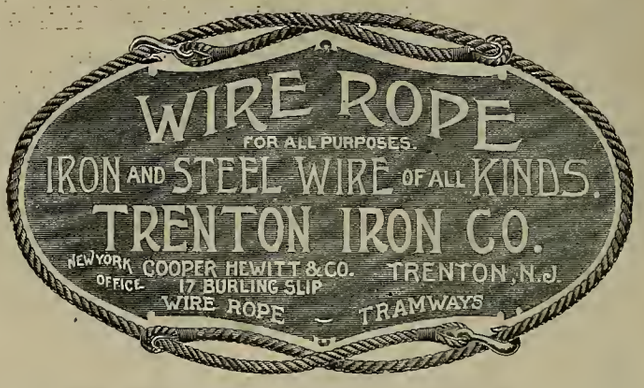
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What is said of the STANDARD ELECTRICAL DICTIONARY.

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Practical Information.

Steamer—Fittings—Maritime Contract.

A claim for the price of a boiler and smokestack furnished in the building of a steamer before her launching is founded on a non-maritime contract, which is enforceable in the State courts, according to the decision of the Supreme Court of Michigan in the recent case of the Globe Iron Works Company vs. Ketcham. The court said: "Whatever may once have been the rule, it is now established beyond controversy that contracts for the construction of vessels and for the furnishing of materials therefor before they are launched are non-maritime, and that liens and proceedings to enforce such liens are under State control and may be enforced in State courts. The latest enunciation of the doctrine by the Supreme Court of the United States is found in the case of the J. E. Rumbell, 148 U. S. 11, 13 Sup. Ct. Rep. 498, where it is said: 'It is now settled that a contract for building a ship being a contract made on land, is not a maritime contract, and that a lien to secure it given by local statute is not a maritime lien, and cannot, therefore, be enforced in admiralty.' Many authorities are there cited and commented upon. * * * After the vessel is launched contracts for equipment or repairs or material are maritime. Before the vessel is launched they are contracts upon land and are non-maritime. The distinction is so clearly pointed out in the numerous authorities above cited, and the rule is so firmly established, that we deem further discussion unimportant. The reason for the distinction appears to be that in the former case the vessel is engaged in commerce, while in the latter case she is not, or, as stated in Lake vs. the Manhattan, 'a ship in esse as a maritime subject gives a maritime character to all transactions connected with it.'"

America's Highest Mountain.

One of the most important results of the season's work on the Alaska survey settles the fact that Mount St. Elias, so long regarded as the giant mountain of the continent, was not on American soil. It was also settled beyond dispute that the mountain was not the tallest on the continent, there being two or three others a little farther inland that out-top it by some hundreds of feet. They are all on British territory, however.

What was almost as interesting as the determination of Mount St. Elias' position, was the determination of its height. This was found to be 18,023 feet, considerably higher than the estimate given by numerous exploring parties from the Geographical Society, and others who have tried to measure the peak.

But the most astonishiug thing was the discovery of two if not three other mountaius, a few miles inland, that are higher than the famous saint's mountain. Of these, Mount Logan is 19,534 feet high, and there are two other nameless peaks that overreach Mount St. Elias by several feet. The surveying parties of the two nations at work on the boundary were mixed in each case—the English having representatives with our Coast Survey men aud the Coast Survey sending men with the English parties.

The Mackay-Bennett Cable.

The steamship "Mackay-Bennett," of the Commercial Cable Company, now in New York harbor, will lay the link which completes the new European cable. The Commercial cable is said be the greatest achievement of Mr. Mackay's life. The high rates charged by the cable monopoly led him to consider the advisability of laying another cable. The cables were foreign. Mr. Mackay decided that the United States ought to have a cable. Then Mr. Mackay and James Gordon Bennett decided to lay the new cable. Mr. Mackay placed abundant means at the disposal of the Commercial Cable Company and he and Mr. Bennett assumed all risks, and shortly the work from Norton's Point to New York city will be completed.

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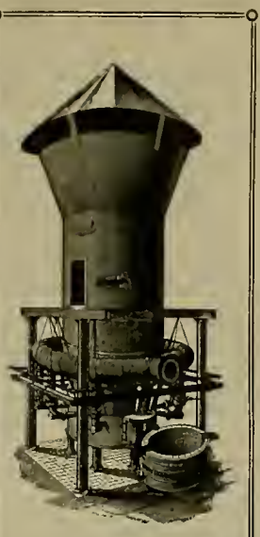

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Bronzing Naval Guns.

When a rifle comes from the arsenal it is coated with grease to prevent rusting during transit, and this coating is kept on uutil the gun has been lifted into its carriage. The grease is then removed by washing the gun with a strong solution of potash. It is washed twice and allowed to dry thoroughly. The gun is then a glistening silver tube. The next operation, says the *Scientific Machinist*, and oue requiring more care, is the application of a mixture of sulphate of copper dissolved in sweet spirits of nitre. To an ounce of each is added a pint of distilled water. Four coats of this are applied, rubbed down hard and allowed to dry for twenty-four hours. Under this treatment the gun is transformed into a warm reddish brown without gloss. By adding arsenic to the same solution and applying again the gun assumes a darker tone. Now comes the hardest part of the work, the polishing. Boiled oil is mixed with beeswax and turpentine until comparatively thick. This is rubbed in with cotton rags at first, and then with the palm of the hand, the result being a mahogany brown tiut. The brown coat lasts remarkably well unless the gun be fired, when the heat of the discharge seriously damages the polish. The last coat is replenished about every month. There is also a process of treatment given to the gun carriages of our new crack cruisers. These carriages are cast, and it is a difficult matter to make white paint adhere to them. To obviate this, the carriages are covered with a thin layer of cement, which is polished with trowels until it is like glass, and the white paint is then applied to the smooth surface.

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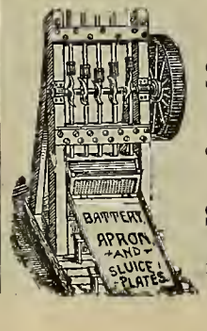

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Market Reports.

The Markets.

SAN FRANCISCO, Sept. 20, 1894.

The sale of 10,000 tons Lake copper hy the Calumet and Hecla at 9 cents for delivery to home consumers October to December, fixes the matter of supply and demand for some time to come. Liverpool reports an advance in that as well as in other metals.

There has been a check to the recent rise in silver. It would seem as though the rise was mainly speculative, and that the China-Japan war would not exercise as huoyant an influence as was supposed. The Japanese government has borrowed at home, and seems able to carry on the contest for some time longer on its domestic resources. "As respects the rumored loan to China in Germany," says a leading authority, "its magnitude is now found to he much less than first reports represented it to he. Instead of £10,000,000, it appears that the amount really in contemplation is only £1,000,000, and it is hy no means certain that the loan will he concluded. That a syndicate of German capitalists bas offered the loan appears to he certain; that they would he glad to take it firm at a price is also understood. But that the Chinese government is prepared to accept their terms is very much doubted. China, of course, may be only haggling, She may wish to induce Europeans to believe that she is much hetter off as regards funds than she actually is, and may thus be trying to put down the terms of the lenders. But, whatever the explanation of her attitude, she does not show the eagerness to horrow which was anticipated."

At present a Japanese loan seems unlikely. Cbina has been buying ships and munitions of war. She has to pay for what she has bought, and what she horrows will be applied to making payments. If the war goes on, it is likely that both China and Japan will have to borrow. If multitudes of men are put into the field, if there is great slaughter, if costly munitions of war are destroyed at a rapid rate, then the expenditure of the helligerents, not only in Europe and America, hut in the field of operatiens, will he large, and it seems reasonahle to conclude that silver will have to he imported in considerahle amounts.

Considerable silver, chiefly in Mexican dollars, is being shipped from here to China and Japan. On the 8th went $300,000, on the 15th $525,000, and it is thought that the steamer of the 25th will take $475,000 more—$1,300,000 tbis month.

New York Prices.

NEW YORK, Sept. 20.--Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	29¼	63⅝	....	....	....
Friday	29½	64¼	9 00	3 05	19 40
Saturday	29¾	64⅜	9 00	3 10	.....
Monday	29½	63⅞	....	....	....
Tuesday	29⅜	63¾	8 75	3 10	19 25
Wednesday	29½	63⅞	....	....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63⅞
Mexican Dollars, nomiual	.53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	12
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, johhing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	15 00	@	18 00
LEAD.			
Pig	—	@	4½
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	5
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lbs			$1 55
Drop, B and *larger* sizes, " "			1 75
Buck, Balls and Chilled, do, " "			1 85
QUICKSILVER.			
Home trade, per flask	35	87½@	36 00
STEEL.			
English, lh	14	@	16
PIG TIN.			
Per lb	18	@	20
ZINC.			
Sheet	8½@		9
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 75
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Cooe Bay			5 50
Cannel			8 00
Egg, hard			9 50
Wallsend			7 00
Scotch Splint			7 00
Brymbo			7 50
West Hartley			7 75
TO ARRIVE—PER TON.			
Australian	5 75	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 25	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 00	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 25	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Sept. 20, 1894.

No more than the usual measure of interest was manifested during the week, the leading Comstocks holding up, though not at a figure that the favorahle news from Virginia City would justify. The only stocks that seemed to respond to the reports from the mines were Chollar and Hale & Norcross, which, hy reason of reported improvement on the 450 Chollar level, sold up to 64 and 75 respectively. The Con. Cal. & Va. Co. has over $130,000 in its treasury after paying all hills, including one of the Comstock Tunnel Co. for royalties. Ophir has had considerahle attention during the week, and that fancy stock which has heen a favorite gamble for almost a generation is still depended on for a favorahle turn uow and then.

Discussing the situation, the Virginia *Enterprise* gives vent to its feelings as follows:

"Things cannot go on forever under the conditions which now exist. There must be a change for the hetter or worse before long. Ore in a mine is all well as a hase of operations on the market, hut it doesn't count for much with dealers if the stock is weighted down like lead.

"People are accustomed to ask: 'Anything new to-day from the mines?' What does it matter? News good, bad or indifferent, it is all the same in so far as it affects the market. The way Con. Virginia has acted since the recent important developments were made does not augur favorahly for any great rise in value if a strike was made of virgin gold at a point along the lode."

The Bodie Con. has declared a dividend of 25 cents per share.

The following illustrates the changes of the week:

MINES.	13	20
Alpha	$	$ 12
Alta Consolidated	15	.....
Andes	58	59
Belcher	79	78
Best & Belcher	1 35	1 30
Bodie	1 60	1 50
Bullion	31	.....
Challenge	.....	40
Chollar	44	57
Confidence	.....	1 10
Consolidated California and Virginia	4 30	4 30
Consolidated New York	.....	.....
Crown Point	77	.....
Exchequer	10	.....
Gould & Curry	74	.....
Hale & Norcross	68	70
Justice	26	22
Mexican	1 30	1 35
Ophir	2 70	2 85
Overman	22	.....
Potosi	70	70
Savage	65	67
Sierra Nevada	1 15	.....
Union	74	76
Utah	8	.....
Yellow Jacket	72	75

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 20, 1894.

FIRST SESSION—9:30 A. M.

150 Alpha	12	100 Hale & Norcross	70
100 Andes	59	400 Kentuck	7
300	58	300 Mexican	1 35
450 Belcher	76	250 Ophir	2 85
100 Bulwer	17	500 Potosi	70
600 Chollar	56	200 Savage	67
100	57	500 Seg Belcher	16
100 Challenge	40	100 Union	76
20 Con Cal & Va	4 30	300 Yellow Jacket	75
400	4 25		

SECOND SESSION—2:30 P. M.

300 Belcher	75	20	4 15
100 Best & Belcher	1 30	100 Justice	22
200 Bodie	1 50	250 Mexican	1 30
100 Bulwer	17	50 Mono	27
200 Confidence	1 10	100	28
300 Chollar	57	100 Ophir	2 80
300	56	100	2 75
255 C. C. & Va	4 20		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 11, 1894.

525,937.—PAPER CAN—Geo. H. Bartlett, Tiburon, Cal.

525,940.—TUBULAR BOILER—J. A. Bernard, Bakersfield, Cal.

525,837.—SELF-LOCKING NUT—A. A. Brown, S. F.

525,948.—FAUCET—C. H. Dunton, S. F.

525,706.—LIFTING JACK—E. & A. G. Hayford, Spokane, Wash.

525,984.—AMALGAMATOR—J. Jett, Walla Walla, Wash.

525,913.—HOP CLEANER—R. J. & J. P. Mackinson, Yakima, Wash.

525,958.—TUBULAR BOILER—E. L. Martin, Kern, Cal.

525,960.—HARROW—T. B. Montgomery, Benicia, Cal.

525,924.—COOKING KETTLE—Belle C. Suhin, Tacoma, Wash.

525,969.—DESULFURIZING OILS—A. Sommer, Berkeley, Cal.

525,970.—LEACHING, ETC.—Storer & Lucy, S. F.

525,875.—HOISTING DEVICE — W. E. Tretheway, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FURNITURE CASTOR.—Siegmund Hamm, San Francisco, No. 525,496. Dated Sept. 4, 1894. This invention relates to an improvement in castors for furniture. It consists in fitting a castor with a shank which is provided with an enlarged head or fillet surrounding it near its base, and an elastic hollow so ket having separahle sides which will give to allow the fillet to pass between them, and an inwardly projecting lip at the hottom which serves to prevent the fillet or head from falling out, while allowing the shank to turn freely around within the socket or casing. Whenever the shank is to be removed from the socket it can he done hy exerting a little strength to pull it outwardly, when the sides of the casing will separate to allow it to pass. At all other times it remains in place, and will not fall out when the furniture is lifted.

CAN SOLDERING MACHINE.—Clarence M. Symonds, San Francisco. No. 525,521. Dated Sept. 4, 1894. The object of this invention is to provide an apparatus for the soldering of tubular metallic cans or similar bodies by the application of molten solder, so that it will flow by gravitation along the seam, and to thus dispense with solder baths and the appurtenances necessary to solder seams in a horizontal position. It consists ossentially in holding the can in an upright position, then applying the molten solder to the upper end of the seam and permittiug it to flow by gravitation through and along the inside and outside of the entire length of the seam and to soak into the same.

VALVE DRAIN CUP.—W. K. Conness, Sacramento, Cal. No. 525,535. Dated Sept. 4, 1894. This invention relates to a means for protecting air brake triple valve mechanism from the effects of dust and foreign substances, and more perfectly preventing the entry of such substances into the delicate mechanism of the valve. It consists of a cock or valve, the casing of which is connected with the branch pipe leading to the valve mechanism upon one side, while its opposide side forms a connection hetween the adjacent ends of the train pipe which meet therein, the cock being placed in close proximity to the passage in the casing which is in line with the train pipe passage, so that when the cock is closed its exterior wall forms approximately a portion of the wall of the passage and makes the passage continuous and practically unhroken, so as to prevent the lodgment of dirt therein.

ROTARY MOTOR.—Auguste Clement, San Francisco, Cal. No. 525,532. Dated Sept. 4, 1894. This motor is of the class in which opposite rotating pistous engage each other and are mounted within an inclosing shell or cylinder. The motor has a shell or case formed of opposing segments of different radius and curvature. There is an inlet passage at the upper end and an outlet passage opposite to it at the lower end. A pistou is mounted in the smaller segment, and is formed of oppositely radiating wings, each of which is convex near the point, concave in the hase and convex again in tbe hub. A revoluble drum is in the larger segment, said drum having recesses on diametrically opposite sides provided with convex walls to coincide with the ends of the piston wings, which are curved to make a rolling contact therewith, when they pass, while the intermediate connecting curved surfaces of the piston are adapted to conform to the convex portions of the drum with a continuous rolling coutact.

FUMIGATOR.—Herman Hoffman, of Byron, Cal. No. 525,497. Dated Sept. 4, 1894. This invention relates to that kind of animal exterminators in which a reservoir is employed to hold a volatile substance with a noxious vapor, which is generated and forced out and down into the burrow of tbe animal, hy means of a current of air from a hellows. The improvements in the present machine lie in the provision of means for ohtaining ready access to the hellows pipe and to the controlling discharge valve, whereby they may be cleaned and kept in proper working order, thereby making it a practical machine.

ELECTRO-MAGNETIC CAR BRAKE.—R. T. Murray and C. M. Allen, San Francisco. No. 525,505. Dated Sept. 4, 1894. The object of this invention is to provide a hrake in which the electro-magnet is attracted with any desired degree of force to the rails over which the car is passing, so that the friction of the brake upon the rail may he increased to any desired degree independent of the weight of the car. It consists of vertically moving shoes adapted to form a coutact with the rails, an electro-magnet which carries the hrake shoes and moves with them, a switch mechanism by wbich an electric current is caused to pass through the coils of the magnet or is cut off therefrom, and a connecting rod or lever whereby the switch is actuated at will. In conjunction with this is a movahle guard extending down in front of the car and connected with the switch-actuatiug mechanism so that the magnet is energized and the brake is automatically applied hy the contact of the guard with any obstruction.

HOSE COUPLING.—N. W. Williams, of Santa Barhara, Cal., and E. B. Seely, of San Francisco, Cal. No. 525,522. Dated Sept. 4, 1894. The object of this invention is to provide a coupling hy which the two parts of the hose may be readily and rapidly connected or disconnected. It consists of a socket portion attached to one of the ends and a coupling end attached to the opposite part of the hose adapted to enter the socket piece and abut against a washer within the socket portion, and lugs which will enter straight slots in the socket portion. A collar is fitted to the end of the socket portion having screw threads hy which it is advanced with relation to the socket portion when turned, and inclined channels made in the interior of tho collar into which the lugs on the opposite coupling end enter when they are in line with the straight slots, and the iuclined channels aro acted upon hy the lugs to rotate the collar so that the lugs are locked heneath it when the coupling end is introduced into the socket.

ELECTRO-MAGNETIC TRACTILE DEVICE.—C. M. Allen, assiguor of one-half to R. T. Murray, San Francisco. No. 525,523. Dated Sept. 4, 1894. The object of this invention is to provide a means for temporarily increasing the tractile force of the wheels of a vohicle so as to prevent them from slipping when power is applied to start the motor or train, or to climb steep grades or under any condition in which it is desirahle to increase the tractile power. This result is obtained hy the use of powerful electro-maguets so arranged with relation to the track over which the car passes that when the magnets are energized, the structure upon which they are mounted will be attracted toward the rails with a power dependent upon the magnetic strength developed, and this attraction is equivalent to the addition of a greater weight to the vehicle whereby the adhesion of the wheels is correspondingly increased.

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Belcher M Co, Nev	49	25c	Sept 14,	Oct 18, Nov 8	C L Perkins
Brunswick Con G M Co, Cal	7	2c	Aug 22,	Sept 25, Oct 11	J Stadtfeld. Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7,	Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	20c	Aug 9,	Sept 13, Oct 4	C E Elliott, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Sept 15,	Oct 16, Nov 5	E B Holmes, 309 Montgomery
Ophir S M Co, Nev	63	25c	Sept 5,	Oct 9, Oct 29	E B Holmes, 309 Montgomery
Potosi M Co, Nev	42	25c	Aug 2,	Sept 6, Sept 27	Chas E Elliott, 309 Montgomery
Silver King M Co, Ariz	11	30c	July 31,	Sept 11, Oct 2	J W Pew, 310 Pine
Silver King M Co, Ariz	12	30c	Sept 4,	Oct 15, Nov 12	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2,	Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Belle Isle M Co, Nev	J W Pew, 310 Pine	Sept 27
Cosmopolitan M Co, Nev	B Barris, 240 Montgomery	Oct 8
Presidio M Co, Cal	L Osborn	Oct 2
Sunset G M Co, Cal	T R Dunn, 630 Market	Oct 1

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State Mining Exhibit.

The officers of the California State Mining Exhibit have make their final reports, as follows:

FINAL REPORT OF THE FINANCE COMMITTEE.

SAN FRANCISCO, September 5, 1894.

To the Honorable Committees of the California Mining Exhibit of the Midwinter Fair:

GENTLEMEN:—Herewith please find statement of receipts and disbursements, with vouchers attached, for all moneys which have been used in our exhibit.

Our exhibit has been a grand success in every way. We started in with rather a discouraging outlook, but, as the comuittees and miners became interested, we were able to raise sufficient money to close up in good shape and have a balance of cash on hand amounting to $1500.

In the statement published in April, under the head of "Resources," you will find that we have not only equaled the amounts we expected to receive in rebates, but far exceeded them. As there has been no decision arrived at as to what should be done with any surplus we might have left, I have the following recommendation to make: Considering the fact that it was through the efforts of the California Miners' Association that the mineral exhibit was begun, and considering the fact that it is through the voluntary contribution of money from miners and mining counties that the Association exists, I would respectfully recomuend that all the surplus funds we have remaining be given by us to the California Miners' Association.

We must thank the different mine owners who so generously contributed their ore to our cause and enabled us to make such a good showing; they were more than generous.

In conclusion I will say that we have been most fortunate in sustaining no loss in any way and that our exhibit was the best mineral display ever before make of California's mineral industry and firmly believe it to be of lasting benefit to the State. Yours respectfully, EDWARD COLEMAN,
Chairman Finance Committee.

SECRETARY'S FINAL REPORT.

SAN FRANCISCO, September 5, 1894.

To the Honorable Executive Committee and the General Committee of the Mining Exhibit of the Midwinter Fair:

GENTLEMEN:—In October, 1893, it was decided to make an exhibit of the mineral industry of this State at the Midwinter Fair; it was difficult to raise money sufficient to maintain the exhibit at first, but, thanks to the energy of our committees, we were enabled to carry the exhibit to a successful close. Permit me herewith to submit for your consideration and approval my report, which embraces to a certain extent the report of the treasurer, showing receipts and disbursements in detail.

MANAGEMENT.—We were most fortunate in having had the services of E. H. Benjamin, Esq., as superintendent, he having saved us many dollars of expense, and, above all, has returned to their respective owners the thousands of dollars worth of gold specimens without a single loss.

SPACE.—To the Executive Committee of the Midwinter Fair, and particularly to Messrs. De Young, Neff and Stump, are we indebted for the gift of space.

TRANSPORTATION.—Our thanks are due to the Southern Pacific Company for their kindness in having transported, free of charge, all ore to our exhibit.

The thanks of our committee are due to Mr. A. M. Huut, the superintendent of the Mechanical Arts building, for his kind and courteous treatment and assistance in many ways. Our guards have been faithful and efficient, and have shown that our confidence in them had not been misplaced. Permit me to thank the committees for their kind consideration in many ways, and I hope my services have proved satisfatory. Yours respectfully, W. C. RALSTON, Secretary.

FINAL REPORT OF GENERAL SUPERINTENDENT.

SAN FRANCISCO, Sept. 5, 1894.

To the Executive, Finance and Advisory Committees of the California State Mining Exhibit of the California Midwinter International Exposition:

GENTLEMEN:—I beg herewith to report that all matters relating to the State Mining Exhibit have been closed and all exhibits reshipped. All claims, of every name and nature, for or against the committee, have been settled and a balance remains in the hands of the treasurer of $1500. Before closing the exhibit and milling the ores, a comprehensive collection of representative ores was donated respectively to the University of California, Berkeley, the Stanford University at Palo Alto, the Academy of Sciences and the Golden Gate Park Museum. I wish, in this report, to extend my thanks to the committee and also to the various county committees and their representatives at the fair, for their courteous treatment and able assistance. I consider that the committee is under special obligations to Mr. Johnston for the use of his excellent concentrator in our mill, as the same did splendid work and greatly facilitated the milling of our ore. Also that our thanks should be extended to the Sites Sandstone Company of Colusa county, the San Francisco Slate Company of El Dorado county and the Inyo Marble Company of Inyo county, for their able assistance in constructing magnificent exhibits free of any cost to the committee, and also to the Joshua Hendy Machine Works for the quartz mill which was operated in connection with our exhibit, and I recommend that a vote of thanks be tendered to each of them. Respectfully submitted,

EDWARD H. BENJAMIN, Gen. Supt.

The total amount received was as follows:

Contribution Account	$ 8,286.00
Rebate Account	673.91
Bullion Account	2,425.41
County Expense Account	655.85
Labor and Materiul Account	106.28
Sale of Minerals	20.10
Receipts of Lecture Anna M. Reed	12.00
Sale of Space	1,108.00
Total	$13,287.55

The total disbursements aggregated $11,787.55, leaving $1500 which was donated to the California State Miners' Association.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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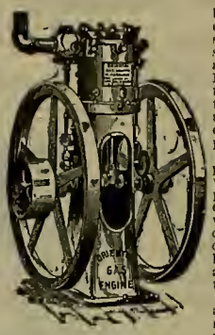

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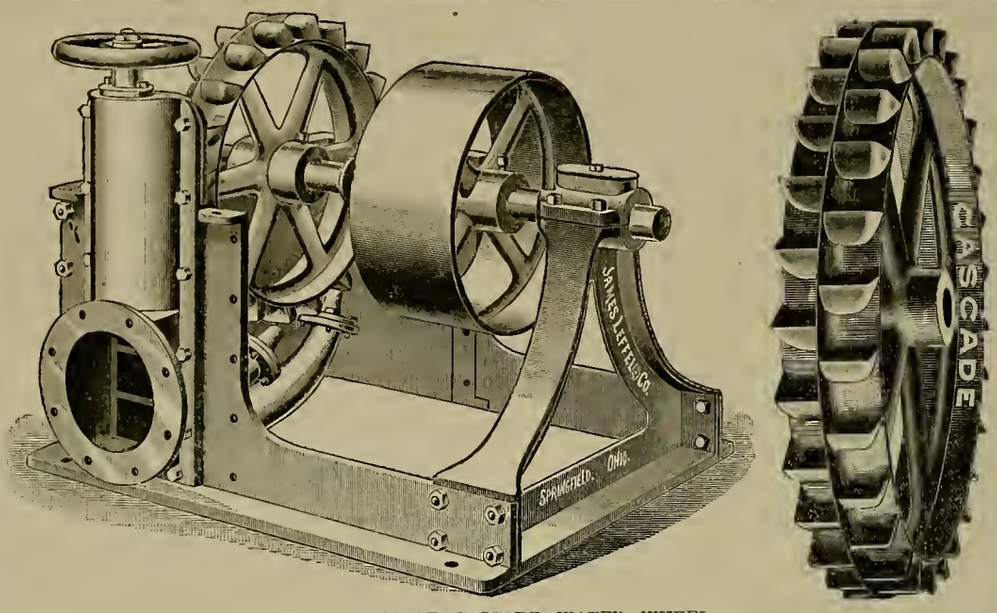
MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 13. SAN FRANCISCO, SATURDAY, SEPTEMBER 29, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Cascade Water Wheel.

Herewith is presented a front view of the triple-nozzle Cascade water wheel, manufactured by James Leffel & Co., Springfield, O. This new Cascade, Hurdy Gurdy, or Impulse and Reaction wheel, was patented by that company in February '91. In the illustration part of the cover is removed, showing the style and character of the runner or wheel proper, and the triple-nozzle system. Among the advantages set forth by its owners and makers in a handsomely illustrated pamphlet from which the description is reprodnced, are: There are no wearing parts except the journals of the shaft, which gnarantees durability and a minimum of cost or expense for repair. The application of the water being at one, two, or three points only, its action upon the wheel is greatly simplified, and the frictional surface of the water materially reduced. Economy in water, especially in small streams, being a matter of great importance, it is successfully secured in this type of wheel.



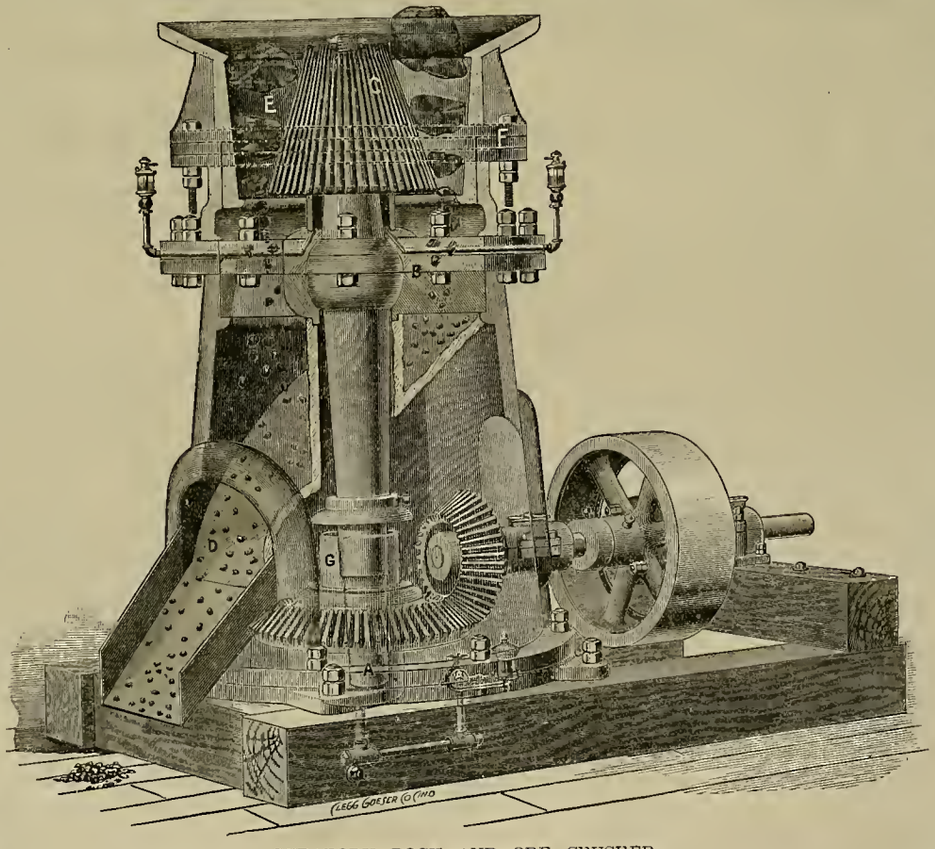
TRIPLE-NOZZLE CASCADE WATER WHEEL.

Admitting the water to wheel through one, two or more tips or nozzles, does not decrease the useful effect of water; but the percentage remains the samo, whether one or more, or a half dozen should be used. Each nozzle increases the power in the direct proportion of the increase of their number, requiring a proportional increase in the quantity of water. This is an advantage of great importanee, since there is scarcely any stream that does not vary considerably during a season. Various sizes of nozzles can be conveniently substituted at any time, to suit the changing condition of water supply at all seasons and at all stages; and, as already mentioned, with the same high economy of power.

An advantage in the nse of this wheel is its slower motion than turbines under high heads. With but slight changes or modifications, it can be adapted in size to obtain almost any required speed, it being merely a matter of diameter, number of buckets, and size of nozzle, the velocity of the wheel, of course, dependiug upon the head pressnre, and the speed upon the diameter, thus changing the number of revolutions with every change in diameter of the wheel for the same head. They are easily and frequently applied to dynamos direct without the nse of belting or gearing. This is also trne as to their application to centrifugal pumps, and occasional other machinery. A vertical gate stem and gate are used, covering two partitions between three openings or entranees of the water into the pipes and conducting it to the nozzles or discharge tips.

If it is desired to run with but one vent, nozzle or tip, the gate can be raised one-third of the distance, or to the first partition, by means of a hand wheel, which turns a screw, operating in a nnt upon the gate. If double the amount of power is required, the gate can be raised another third of the distance, embracing two-thirds of the entire opening, and stopping upon another partitiou; thus supplying auother tip or nozzle. Should a still further amount of power be desired, or three times the amount of one nozzle, or fifty per eent more than two nozzles, the gate can be run by the hand wheel, to its full height and water admitted to the third nozzle, thus affording a fnll vent or discharge of the three tips or nozzles.

It is ordinarily mounted on an iron frame, as shown in the cut, but can be placed on a wooden frame for transportation over difficult roads. With a 65-ft. head of water a 38-in. wheel makes 165 revolutions per minute, using 33⅓ cubic feet of water per minute, and giving 3⅜ H. P.



GYRATORY ROCK AND ORE CRUSHER.

Gyratory Rock and Ore Crusher.

The new ore crusher herewith shown is manufactured by the National Machinery Company, of Tiffin, Ohio. It will be observed from the engraving that the top of the hopper is entirely open, and this permits the dumping of whole carloads of stone directly into the machine.

The belt is applied to the heavy cast iron band wheel or pulley, which is attached to a brake hub by means of two common machine bolts, the brake hub only being keyed to the horizontal countershaft. The band wheel would revolve loose on the shaft were it

(*Continued on page 199.*)

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Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, September 29, 1894.

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Economy.

Ecouomy in State government is a preseut theme. Some of our State contemporaries suggest that the State Mining Bureau should be dispensed with. It sometimes happens that the most importaut and valuable of all State expenditures are opposed by well meaning people who do not know the facts. While it is not to be denied that a better system of State economy should in some cases prevail, it would be manifestly unwise to attempt any interfereuce with an institution like the State Miuiug Bureau, which is so economically administered and which bestows a value of ten dollars to the State for every dollar expended.

Without any attempt at invidious critieism or comparison, it is believed that should the agrieultural journals that so justly call for economy and retrenchmeut feel thoroughly in earnest they can find considerable to reasonably oppose. The State appropriated $230,000 for '94–'95 for State and district agricultural societies. It is only stating a well knowu fact to say that that two hundred and thirty thousand dollars is practically wasted. The most of it goes for salaries and horse races, and the horse races are demoraliziug gambles. Horse breeding is a commendable thing, and to be eucouraged, but the way the State money is expended has, as everybody knows, no more to do with practical improvement than a stock deal has with the assay value of the ore.

The salaries of couuty officers form another suggestive theme. Immense sums can be saved in a variety of ways, but it is our belief that calm, dispassionatc, unprejudiced consideration of the facts will show that any attempt toward eurtailing the active work now iu progress in the State Mining Bureau would be a direct blow to the prosperity of the commonwealth. It is an institution that is a source of profit to the State. Eeouomy is simply the judicious expenditure of mouey. Sometimes it is economy to save five cents; other times it is economy to spend a thousand dollars. Economy is a matter of business, not of sentiment or prejudice or belief.

THE "feeder and main patent" has been declared void by the United States Circuit Court of Appeals. The result of this famous point of dispute among rival electric compauies is that any one can make and sell a dynamo or motor with the "feeder aud main" system without being held liable to infringement of special rights.

SENATOR HARRIS of Tennessee says he "would like to see an iuternational argument on the silver question." The events of the last four years furnish the most powerful argument, international or otherwise, that can be conceived, illustrating the universal need of remonetization.

The Gold Era.

The Preseott, Arizona, *Courier*, in its issue of the 21st, states that "Preseott is the gold-mining hub of North Ameriea." Similar elaims are made by enterprising eoutemporaries in New Mexico. Colorado, whieh made considerable complaint of adversity some time ago, announces in several of its journals that it "will eontest California's claims as the first gold-produeiug State." Wyoming asserts that while other States may mistakenly believe theirs to be the greatest gold produeers, the soon-to-be-developed placers in that State will show what can really be done wheu it comes to produciug the yellow metal. Reeeut discoveries in Nevada indicate great yield of gold, and Oregon papers contain credible statements showing commendable activity, though we are hardly prepared to accept the unsupported assertion in oue Webfoot journal that Oregon is par excelleuce *the* gold-produeing State of the American Uuiou. Alaska also points to its great gold producers as evideuce of its eoming prominence.

It is of interest to note the tone of confidence in whieh each seetion speaks, whieh, taken as a whole, indieates the active prosperity of the gold-miuiug iudustry iu the west half of North America. The reports, partly offieial, from South Afriea, Australia and other distant parts of the globe, show the advance of "the gold era." While it is not likely that even the most rabid monometallist who talks of "pig lead" and "pig silver" will ever be obliged to allude to "pig gold," world-wide reports show that gold production is aud promises to be abnormally large.

In this regard there is uo emulatiou or rivalry on the part of California. This commonwealth rejoiees to see sueh evidenee of richness iu its sister States aud Territories, aud would be glad to have the most sauguine statements of any and all more than verified by the facts.

Meanwhile the fact is worth noting that "what is seldom is wonderful." The gold yield of California is a steady, matter-of-fact event. Californians don't make much noise about it; indeed, the biggest gold producers in the State are rarely heard of, but it must not be supposed that beeause the sales and diseoveries and transaetions in California gold properties are not blazoued to the world, that they are unimportant. It is likely that it would be better for Californa if there were more notoriety given these things, but it goes without saying that great quautities of gold are always being produced in Californa, and the most of us let it go at that. California always was a land of marvels, and things that would sound wonderful if wired from other regions are here accepted as a matter of course. It is so with every product of the field, the forest and the mine, and has been so for so long a time that it is accepted as mueh a ease of ordinary procedure as the tides or the trade winds or the pluudering of the politicians.

But the other day, with all the prestige that transmission over the wire and fat, black type can give, came the startling allegation that one million dollars had actually beeu refused for a certaiu gold mine in a neighboring State. It uever occurred to any one in Californa to deem it of sufficient importance to souud abroad the fact that $6,000,000 had just been refused for oue of California's gold mines, that teu milliou wouldn't buy it, and that there were couuties in California from each of which over $200,000,000 in gold had been dug and which were still anuually yielding more millions. Like the big trees, the Yosemite, the climate, etc., these things we have always with us.

'93 may be considered the begiuning of the new gold era. That year this couutry produced 1,740,000 fine ounces, worth $36,000,000. Of this, Californa's credit is $13,000,000, though $15,000,000 would, probably, be nearer the facts. Iu the same time the South African Republic produeed 1,610,336 ounces. It is calculated that the total output of what our British contemporaries call "raw gold," for the current year will greatly exceed that of '93.

The Director of the Mint thiuks that the world's yield of gold for '94 will be $175,000,000. Others say $185,000,000. This is calculating that the United States will produce $45,000,000, and that Australasia aud South Africa will show au equal percentage of inerease. The one thing uow evident is that every oue engaged in its production is making an effort that, so far as he is concerned, his total output shall exceed that of auy former year.

The Geologic Survey.

Chas. D. Walcott, director of the U. S. Geological Survey, will be here next week. He has sent his secretary in advanee to purchase a campiug outfit, aud will continue a reconnaissanee he was on in 1879 when summoned by Major Powell to Arizona. He and Clarence King had worked their way eastward over the Pahranagat range nearly to Owen's lake. Now he proposes to visit that valley to quietly study some geological problems that made so deep an impression on his mind fifteeu years ago.

The survey has a good deal of work now on hand. Four field parties are now engaged in the areal survey of the coal fields of Teuuessee, Virginia, West Virginia aud Maryland; one party making a preliminary study and reconnaissauce of the gold belt of Georgia, South and North Carolina aud Virginia; one party on the southern limit of the roofiug slate belt of easteru New York; one large party on the iron ores of Northern Wisconsin; one party on the mining districts of the Helena atlas sheet of Montana; one party on the Cripple Creek gold field aud making a reconnaissanee of the Rico district of Colorado; one party completing the survey of the Leadville, Colo., district; one party surveying the coal fields of the Triuidad, El Moro and Walsenburg sheets, Colorado; one party studying the artesian water problem of the valley of the Arkansas in Colorado aud Kansas; one party engaged in the study of the water supply of the Uuited States, especially in the arid and semi-arid eentral region; oue party examiuing the clays, ete., in connection with the areal geology of ceutral Texas; one party making a reeouuaissance of the mineral belt of central Idaho; two parties eugaged in the areal mapping aud study of the gold belt of Californa; one party making an examination of the ziuc deposits of Arkansas. It is also planned to eontinue the study of the phosphate deposits of the State of Florida during the winter aud to begin the mappiug of the eoal deposits of southwest Oregon and eentral Washiugton in the spring of 1895. In addition, work on the geology of highways has been started, and the eeonomic chemieal work of the Survey is continued. To provide topographic maps for geologic work, thirty-two field parties are at work in various seetions of the eountry.

Au areal geologic map represents all that can be aseertained concerniug the various roeks within the limits of one of the atlas sheets. This information is platted upon a topographic base and shows the character of the rocks, whether they are of igneous or sedimeutary origin, mineral-bearing or otherwise, aud, in the cross structure sectious, the underground geology as far as it can be ascertained.

Mr. Walcott will be in California during the first half of Oetober, and will then go to Oregon and Idaho.

WE might as well permit our enemies to direct the movements of our armies in time of war as to permit them to direct or control our manufactures and other industries in times of peace. The present pressure illustrates the folly of Uncle Sam in assistiug his rival and creditor Johnny Bull to demonetize silver. England buys from fifty to sixty millions of silver annually to use iu her trade with India, China and other eastern countries. When our mints were open to free coinage she never bought au ounce for less than $1.29. Now she gets it for about half price. Every ounce will buy as much wheat and cotton in India as it ever would, but, the silver ounce costing less, the cost of these staples delivered in Liverpool is reduced one-half through half price silver. This regulates the priee of all wheat and cotton England buys from us, and these staples form nearly one-half of our exports.

POLITICS permeates business to an unusual extent in Colorado. The following advertisement is clipped from the advertising eolumns of the Denver *Record:*

The defeat of Waite is so well assured that investors should make haste to secure holdings in good stocks before the election of a deceut administration shall bring an advance in prices. Even the prospect of this is already beginning to have its effect in bracing the market. To clients who have deferred investing on account of our political muddle, I will say that the certainty of a change is so great as to afford good ground for buying at this time, and those who buy judiciously now will rejoice after the November election. Orders carefully filled. Prompt and full reports. ——, Mining Broker.

Concentrates.

THE *Union* says the Grass Valley Miners' Union has a membership of 700.

A 100-TON BROMINE PLANT, the Englehardt process, is being put in at Helena, Mont.

THE Anaconda Co. has bought the Poulin mine, an adjoining copper property, for $137,000.

THE Reno Borax Co. shipped a carload of borax to New York last week weighing 36,000 pounds.

WITHIN a radius of a few miles of Juneau, Alaska, 380 stamps are dropping night and day.

THE *Record* hears that the total value of the gold output of Cripple Creek will pass $5,000,000 for '94.

C. RIMBAL and D. Young have sold their mines at Sumpter, Or., to A. W. Ellis and J. F. Cupid of Pioche, Nev., for $25,000.

THE Mercur Company reports a total shipment of cyanides for the month ending September 15th amounting in value to $32,000.

THE Territorial Fair held at Albuquerque, New Mexico, awarded the Cochiti mining district first prize on gold and silver ores.

THE week's cleanup of the Ontario mine, Utah, was 25,000 ounces of fine silver. This, in the shape of 55 bars, was shipped to this city.

THIRTY MEN are employed at the New London mine near Plymouth, Cal. The Alpine mine near there has been bonded by San Francisco men.

THE Ione mine, recently acquired by the Omaha Mining Co., is to be thoroughly developed under the superintendency of Geo. Mainhart.

THERE are now, according to the official returns, 12,000 people on the Coolgardie (West Australia) gold fields. In Coolgardio itself there are about 3000.

THE *Democrat* reports the sale of the Lost Confidence mine, ten miles from Redding, to New York men who will build a big smelter and put 200 men to work.

THE Gold Cable Mining and Milling Co. of Tacoma, with mines at Anaconda, Mont., are doing development work on a 100-foot ledge of gold-bearing ore.

LAST TUESDAY the Homestake Company paid its regular monthly dividend, No. 194, of 20 cents a share, aggregating $25,000, and a total to date of $5,287,500.

G. HENDERSON, J. G. VAN MARTEN AND D. C. CALKINS have incorporated the Sammer Placer Mining Company at Virginia City, Montana. Capital stock, $100,000.

THE Centennial Eureka mine, which has been a paying proposition for over five years now, declared a double dividend last Saturday amounting to $30,000.

NEVADA COUNTY MEN are putting new machinery in the Mt. George mine, near Newtown, and propose to thoroughly develop the mine, which is a promising property.

THE receipts of the Denver mint last week were $247,319.58. The receipts for the corresponding week last year were $51,-101.24, there being an increase of $196,218.34, or about 383 per cent.

THE Parnell Mining Company has incorporated in this city. Directors—W. G. Arnold, H. B. Arnold, E. W. Arnold, R. S. Montenegro and R. W. Koch; capital stock $100,000, all subscribed.

THE Tuolumne *Independent* reports that last Monday Harry Roberts took out $5000 from his claim at Tuttletown, and that John Leachman is putting a ten-stamp mill on the old Ham & Birney mine.

SAN FRANCISCO men have paid $1,000,000 for the property of the Gold Mining and Milling Co., at Breckenridge, Colorado. The development tunnels and shafts expose ore estimated to be worth $200,000.

AFTER October 1st the petroleum refinery of the Rocky Mountain Oil Company will be closed indefinitely. This and the Standard Oil Company have for some time been warring in regard to prices.

BESIDES the Surprise gold mine in Pompton Plains, N. J., the Budd's Lake Mining Company is working a tract of alleged gold fields, and several other concerns are delving enthasiastically for precious metals in New Jersey.

AT the Broken Hill Proprietary mine, for the week ending Sept. 6, 10,912 tons of ore were treated, yielding 700 tons lead, containing 233,701 ozs. silver; also 142 tons treated by amalgamation and leaching, yielding 31,257 ozs. silver.

SENATOR JAMES HARLAN, of Mt. Pleasant, Iowa, is at the head of the syndicate which has bought the General Weaver, near Balarat, Colorado. The new company is known as the Colorado Gold Mountain Mining Company, and is capitalized for $1,500,000.

IN its annual statement the Parrot Silver and Copper Mining Co., of Montana, reports the amount of the capital stock of the corporation at $2,300,000, the whole of which has been paid in. The existing indebtedness of the corporation on June 1st was $139,717.

LEADVILLE has discovered platinum, according to recent reports from there. It came to light in assays made of Granite ore, and runs about an ounce to the ton. It cannot be successfully worked at less than two ounces to the ton. Platinum is worth about half as much as gold.

THE annual report of the Boston & Montana Mining Company is as follows: The capital stock is $3,750,000, paid in as follows: For property, $2,500,000; cash, $1,250,000. The amount of existing indebtedness, including bonded indebtedness secured by mortgage, is $1,708,374.18.

THE company which took possession of the Mountain Lion mine in Missouri Flat district last August have commenced active operations and have already worked a great change there. Men are employed in developing the property, as also a ledge which is distinct from the old one.

THE annual report of the Princeton Mining Company of Montana states the amount of capital stock is $5,000,000, paid in by purchase of property situated in Boulder district, Granite county. The amount of the existing indebtedness is $132,000 and interest, and consists of bonds of the company for $1000 each, payable on or before the 1st of January, 1891, with interest at eight per cent per annum, made to the Farmers' Loan and Trust Company of New York.

THE Gertrude, Graud View, White Elephant and Sunnyside mining properties in the Wachuca mountains, southeastern Arizona, three miles from the Mexican line, are reported sold to J. W. Pierson & Co. of this city for $27,500. A stamp mill and other machinery will be immediately put on the property.

FROM Leadville is reported the production of gold ores at over 500 tons a day, with new disclosures taking place each week along the gold belt. In addition to this, a large amount of low-grade silver ore running high in iron is being produced, and through it hundreds of miners are provided with employment.

THE New Combination gravel mine at Poormun's Gulch, two miles from Mokelumne Hill, has been bonded to a Los Angeles company. There has been considerable work done on this property by its former owners. An incline tunnel 600 feet in depth has been run, from the bottom of which a level was run 300 feet.

THE Horse Fly mine at Caribou, owned by the Canadian Pacific, produced lately 287 ounces of gold in a run of 106 hours with 900 inches of water. The Caribou mine produced 302 ounces of gold in forty-seven hours. It is now proposed to run the Horse Fly mine with 2000 inches of water and the Cariboa with 3000 inches of water.

THE Prescott, Arizona, *Courier* thinks that there is a "great deal of senseless gush on the silver question." It says that "as a matter of fact, silver and gold are of far less actual value to mankind than iron." Yet, somehow, says *Mining Industry and Tradesman*, the most of us are so perverse that we would rather have a pound of gold or a pound of silver even than a ton of iron.

THE Silverton, Col., *Standard* says: The Nevada mine, which during the past two years became so prominent as a large producer, has been sold to E. G. Stoiber, owner and operator of the Silver Lake, Rochester and several other good properties on Round mountain, Silver Lake basin, Col. The consideration must be something big, as the owners of this property last year refused $600,000 for it.

THE gold yield of Arizona for the year ending June 30, '94, was more than $2,000,000, and from the present rate of production the output for the year 1894 will reach over $4,000,000. The silver output for the same period was over $2,000,000 in value, which, had the old price prevailed, would have reached nearly $4,000,000. The copper output was over 45,000,000 pounds, and there was over 5,000,000 pounds of lead.

THE London *Mining World* of the 8th inst. reports John Hays Hammond in Mataheland, Africa, on a tour of inspection, and speaks of him as "this practical expert, without whose opinion none of the big houses in Africa or the big companies whose headquarters are here seem to touch anything connected with mining." He has so far made favorable reports on the mining properties examined in that far-off region.

THE Eagle mine at Grizzly Flat, El Dorado Co., is now being operated by the Edelman Gold Mining Company of San Francisco, which was incorporated about six weeks ago with a capital stock of $500,000. The Eagle mine is north of the Mt. Plensant mine and is on the same mineral formation. It was first worked in 1852 and is said to have produced a million of dollars by the imperfect methods of early quartz mining.

THE Commercial, Birchville, Iowa, Union and Wisconsin claims, near Graniteville, Cal., have been bought by J. E. Miller of this city and S. Fowler of Grass Valley for $25,000. The new owners intend putting up a five-stamp mill to begin with. It will have very coarse screens which will admit of the passage of ore the size of bird shot, then after leaving the battery the finely crushed rock will be put through a Huntington mill.

THE *Record* says several of the silver mines of Ouray county, Colorado, are showing an increase of gold in the ore. There has always been more or less of the yellow metal in the pay of these fissures, though it has generally been less rather than more. Of late in some of the seams there has been a complete turn about, particularly in the great Virginius vein, where at points the gold values are several times larger than the silver contents.

THE report of the Arizona Copper Company of Clifton for six months ending March 31, 1894, shows profits on copper of $23,-000; expenses, including taxes, $20,380, leaving a surplus of $5629. In addition, the profits on the company's stores were $38,650; rents, $2851, and from the railroad $50,737, making a total of $94,887. From this is deducted $54,516, required to meet interest on mortgages and debentures, leaving a net surplus from the half year's business, $40,371.

THE Montana Mining Co. report their output for August was: Gold, 2840 ozs.; and silver, 31,190 ozs. The estimated realizable value of the same is $74,900. The tonnage of ore milled during the month was 6350 tons, 110 stamps having been in operation. The expenditure was as follows: Working expenses on revenue account, $38,100; outlay on developments, $8600; extraneous expenses, including insurance, $960; on permanent improvements account, $100—$9660; total expenditure, $47,760.

ARTICLES incorporating the Mineral Hill Mining and Milling Company have been filed at Spokane, Wash. Capital stock, $300,000, in shares of $1 each. The company reserves $100,000 as treasury stock for the purpsse of development. The incorporators are: Dr. W. P. Dunlop of Alpena, Mich., and T. Ehrhart, J. F. Adams, F. L. Stutermeister, Jr., Charles Hall, R. N. McLean, W. D. Scott and C. F. Helphrey of Washington. The principal place of business will be Spokane, with a branch office at Conconnully.

THE London *Mining Journal* says: The Rand Central Ore Reduction Company has developed a new cyanide process, known as the Siemens-Halske. In the MacArthur-Forrest process the gold, after having been extracted from the tailings, is precipitated by means of zinc shavings; while under the new method the gold is deposited by electrolysis on two thin lead sheets. The process is being used at the Worcester property, where 3000 tons a month are being treated. The Reduction Company is also testing an aluminum process.

THERE is now more hard work, careful managing, better results and less money expended in mining than ever before, in Colorado, the Telluride *Republican* says. Hard times demand this method, and everyone is working for what there is in sight and yet to be found. The old-time method of mining—that is, staking claims, developing the same by wind work, placing property on sale by assay certificates—is a thing of the past. Time says this does not pay. Extensive development and continuous mill runs are the required methods of mining now. There have been more paying mines brought to light this season than there have been prospects staked.

THERE are 200 men working in the sands of the San Juan, Colorado. A man with a hand rocker made out of a candle box makes $3 to $7 a day. With improved machinery he can do much better. The gold-bearing sand extends for seveuty miles down the river from Farmington. The valley is one-eighth of a mile to one mile in width, and the sand averages fifteen feet deep. In many places it is twenty-five feet deep. The depth of fifteen feet gives 25,000 cubic yards to the acre, and, with a good process, the sand yields twenty-five to sixty cents a yard.

THE Winnemucca *Silver State* grows poetic, and says: Nature is gradually adopting the gold standard. The earth will soon be full of the glory of the goldenrod, the yellow leaves and the gold tinted daisies. But we look up and see that the heavens have adopted the silver standard. We see the silver tinted clouds, the silvery stars and the crescent moon shining like an argent on the breast of night. Earth and heaven have together adopted the double standard. Hence the man who wants the earth and expects to get to heaven must be a bimetallist.

THE Anaconda Copper Company of Montana, it is said, has no contracts for 1895 delivery, and many of the Eastern stockholders in Montana companies are earnestly hoping that this great company will suspend operations for a time at the close of the year. Should this happen, they believe they would be benefited, as the price of copper would advance to ten cents and over. The *Inter-Mountain* says there is little probability of the Anaconda closing down, except possibly for a week or so for repairs. It is known that the European bankers who contracted to supply foreign governments this year with copper are very anxious now to make contracts for similar large amounts for delivery in 1895.

AT Jackson, Amador Co., last week, the case of the Keystone Mining Co. vs. South Spring Hill Mining Co., came up. The complaint alleges that the amount of ore taken from the plaintiff's mines is 200,000 tons, and the value of the same $2,000,000, and asks judgment for the amount, also that defendant be enjoined from entering the works pending the suit, and perpetually enjoined from working the ledges and ore bodies claimed to belong to plaintiff's mines. The defendant claims that the ledges met with in the South Spring Hill are blind ledges, and have no surface croppings either within the defendant's or plaintiff's claims. That the ore bodies worked were not in the nature of defined ledges at all, but simply separate deposits.

AT Horseshoe Bend, on Salmon river, Idaho, a tract of 600 acres has been bought by J. W. Burke and O. D. Garrison of the Cœur d'Alenes. This comprises several big bars that have been worked at various times with considerable profit by different parties since first located thirty years or more ago. The only way to operate the placers to advantage is by the use of improved machinery and a complete hydraulic plant. The purchasers will adopt economical appliances and methods for working the ground on a large scale. If it is possible to ship in machinery this season, a start will be made to open the placers the present year. Otherwise, everything will be in readiness to push the work early next spring. Talk is heard of the organization of a company with a large capital to operate on the Salmon. The recent purchase is presumed to be the first move in that direction. Another big deal is pending for the transfer of a large acreage of placers on the Salmon, near Slate creek.

SAYS the Baker City, Or., *Democrat:* Win Johnson's sluice boxes were cleaned up for him by outsiders last week without his knowledge or consent, and between $1500 and $1800 in gold and quicksilver purloined. Mr. Johnson, this summer, as has been his custom, has been operating an extensive placer claim on Crane gulch, seven miles north of Granite. He employed four Chinamen to assist him. When he commenced operations three months ago he deposited fifty pounds of quicksilver at the head of the sluice box, but when he came to clean up last week he only found ten pounds. He is of the opinion that the robbery has been going on with great regularity for some time, and that the final act was committed last week. He thinks the amalgam stolen at different times was worth between $1500 and $1800. He generally cleans up about $4500 as a result of a three months' run. He will be a trifle shy this year, as the robbery knocked off some of the profits.

E. Y. NAYLOR, one of the owners of the Cozzens group of lodes on Williams' Fork, Grand county, Col., tells the *Courier* that round, water-worn quartz and granite boulders, from four to twelve inches in diameter, are found at various depths in these veins and as deep as they have been opened, or nearly 100 feet. They are sometimes found loose in beds several feet deep, and sometimes bedded in solid gangue rock. These boulders bear no resemblance to the gangue of the veins, and were undoubtedly washed into the crevices during the process of vein filling. When broken open they are found to be impregnated with the same minerals found in the adjoining gangue—silver glance, polybasite and raby silver ore. That these minerals were formed in the boulders after they had found lodgment in the veins can hardly be refuted. Such occurrences bear out the statement that mineral deposits can be formed subsequent to vein filling, and in all probability many ore deposits have been formed in that way by means of hot waters.

THE directors' July report of the Robinson (South Africa) gold mine is as follows: Quartz mined, 8657 tons. Development, 1165 feet. Average width and assay value of south reef developed during month: Width, 10 ins.; assay value, 3 ozs. 12 dwts. Mill: Stamps at work, 70; net running time, 28½ days; tons crushed, 8657; tons per stamp per diem, 4.3; gold won from above, 8555 ozs. 2 dwt. Chlorination and cyanide works: Gold won from own concentrates (by chlorination), 1102 ozs.; bullion from tailings (cyanide process), 1473 ozs. 9 dwts.; from own ore, 11,130 ozs. 11 dwts.; gold from concentrates purchased (by chlorination), 2798 ozs. 19 dwts.; total, 13,929 ozs. 10 dwts.; cash profit for month, £24,017 8s 10d. Owing to accident to rock breakers, the mill was delayed 30 hours. The August report is as follows: Mill: 70 stamps at work; 9507 tons of ore crushed. Yielded in smelted gold, 9030 ozs. From concentrates (by chlorination), 1160 ozs. From tailings (cyanide process), 1958 ozs. From own ore, 12,148 ozs. From concentrates bought (by chlorination), 2371 ozs. Total gold recovered, 14,519 ozs.

"Desert" Mines of California.

During the thirty-four years of its successful existence the MINING AND SCIENTIFIC PRESS has portrayed every nook and corner of the State and coast where mining is carried on, illustrating copiously with engravings made from actual photographs, and whether on difficult mountain sides, in the beds of streams, or by flash light, 2700 feet below the surface, the exact appearance of the scene described has been reproduced.

This week space is given to a region not usually noticed, but which is coming into prominence—that part of California generally described as "the desert." The reading matter is from a personal visit made this summer by C. F. Von Petersdorff, M. E. The illustrations are used by courtesy of Mr. G. F. Weeks of the Bakersfield, Kern Co., *Californian*. That part of "the desert" embraced in Kern county is herein referred to in speaking of the gold mining operations now going on.

The gold-bearing formation extends from the Tehachapi mountains in a northeasterly direction past El Paso peak to the Summit, and along its line mining camps have been established and claims are being worked. The principal ones are Red Rock, Black Mountain, Goler and Summit. The easiest way of reaching them is from Mojave. A stage line has been run from there to Keeler for many years over excellent roads, and the product of the various borax works is brought here on trains of especially constructed wagons, drawn by from sixteen to thirty mules.

Leaving Mojave by the Keeler stage road in a northeasterly direction, the first indications of gold mining are met with a mile and a half west of Nugent's Station, sixteen miles out, where Judge J. A. Haralson of Tehachapi has commenced work on a ledge nearly 600 feet in width, of low-grade free milling ore, assaying from $2.50 to $15 per ton—the Oasis mine.

Water has been found in neighboring gulches, and if it can be developed in sufficient quantities to justify the establishment of a quartz mill, it will prove a valuable property. The work done up to the date of Mr. Von Petersdorff's visit—June 4, 1894—consisted of two drifts run for the purpose of prospecting, one along the footwall and the other into the center of the ledge. Four miles west of the Oasis mine, and on the very summit of a high peak, J. J. McLaughlin is engaged in placer mining, and reports satisfactory returns for his labor. Three miles farther on is Red Rock mining camp, at the junction of Red Rock and Iron canyons.

Although water is quite abundant at this point, the high percentage of alkaline admixtures makes it unsuitable for drink. Drinking water is obtained at a spring a mile and a half up Red Rock canyon, where the stage company has established a station.

The mines now worked are located in Iron canyon and its tributaries. The principal ones are the Bonanza and the Success. The former is operated by a corporation which owns and controls a number of paying claims and is about to revolutionize the present method of mining with the aid of "dry washers," by the development of water and introduction of "sluicing."

A word in regard to "dry washing." The usual way of working placer deposits by means of sluices, rockers, etc., requires a sufficient and steady supply of water, which was not obtainable in this and other arid localities where gold-bearing deposits were discovered. The lack of water delayed operations for a time, until apparatus could be evolved to fill the requirements of the case; the result is the "dry washer." It is based upon the same principle as the fanning mill, which separates the grain from the chaff, with such changes as are required by the difference in the material to be handled.

Although between thirty and forty different styles of dry washers are now in use in the desert mining region, one general description will fit them all, since their difference consists merely in peculiarities of adjusting their several constituent parts, as the angle of the apron, mesh of screen, height and number of riffles, etc.

A dry washer consists of a strong wooden frame, to the bottom of which is attached a bellows, the top of which forms the riffle board, consisting of

COLONNADE ROCK—RED ROCK CANYON.

RED ROCK SPRINGS.

PULPIT ROCK—RED ROCK CANYON.

BONANZA MINE—IRON CANYON.

RED ROCK MINING CAMP.

WORKING A DRY WASHER.

wire netting covered by canvas, across which the riffles are nailed. Above the riffle board is the apron, and above it the screen. A simple crank and gear sets the bellows in motion, and by percussion gives a shaking movement to the apron. While one man is turning the crank another shovels the pay dirt on to the screen, through which it falls on the apron and from it on the riffle board. The intermittent blast blows the light particles of dust and sand away, while the heavier ones, and with them the gold, are caught by the riffles.

After a number of shovelfuls of dirt (from 50 to 100) have been run through the machine, the riffle board is taken out, the larger particles of gold are picked out by hand and the rest is dumped on a sheet of canvas, to be once more run through the machine at the close of day, or when a sufficient quantity of the concentrated pay dirt has been collected.

It stands to reason that such a crude method entails considerable loss, still it has been demonstrated that experienced men can save under ordinary circumstances up to 85 per cent of the gold obtained in the dirt. So-called tests made for exhibition purposes, in buildings or other sheltered spots where everything is in favor of the machine, the dirt perfectly dry, etc., giving the remarkable result of no loss whatever, are absolutely worthless, for the reason that in actual work you have frequeutly to count upon strong winds, the moisture of the soil, which causes it to form clods enclosing particles of gold which are thrown off the screen and lost, and a half-dozen other difficulties and obstacles which are met with incessantly in actual work, but are not even thought of in tests made for the purpose of showing off some particular machine.

The Bonanza mine, Red Rock, was discovered and located last October, and sold to the present owners last January, during which period between $6000 and $7000 is reported to have been extracted. Since then an equal amount has been put out. The company is now engaged in the construction of water works, the cost of which is estimated at $6000. They have ordered a pump, a 45-horse power boiler, and two miles of five-inch pipe, by means of which they expect to raise 200 gallons of water per minute during eight hours to a point 560 feet above the well, which they have begun to sink at the junction of Iron and Red Rock canyons. Should the supply of water warrant it, a second reservoir will be constructed at the height of 860 feet. The well is to be eight feet by sixteen feet in dimeusions, and will probably be twelve feet deep, at which point bedrock is expected to be struck. From the bottom of the well a tuunel will be run across the canyon, which will collect all the water running down both canyons. As there are numerous springs above the well, and the ground is wet on the bedrock all the year round, the supposition is that they will be successful in obtaiuing the water necessary for their purpose. From the reservoir into which the water will be pumped, all of the twenty-four claims of the Bonanza Company, as well as adjoiniug properties, can be supplied and worked with sluice boxes. There will be but little loss of water, as practically all of it will eventually find its way back into the well from which it is pumped.

Adjoining the Bonanza property, and to the north of it, is the Success miue. Gold was first discovered in this district on May 10, 1893, by the owners of this claim. On October 16th the first claim, the Success, was recorded. The output of this mine since then has been about $2000; that of the entire Red Rock district, $12,000.

This and a great number of other claims, which are at present worked in a somewhat desultory fashion, will be vigorously operated as soon as the water works are in shape. Even now the average output is $3 per man per day of eight working hours, and large nuggets are frequently found. The diggings worked at the present time are mostly shallow, from eighteen inches to four feet deep, aud but little ground is worked that is deeper. The deepest diggings are from fifteen to fifty feet down. In these cases drifting is resorted to.

The pay dirt consists of a mixture of gravel, sand, volcanic breccia and lava, forming a secondary wash which covers the hills and gulches for twenty miles or more and does not differ materially in the several mining camps. Huge bowlders of granite, lime, quartz, hematite, epidote, kaolin, chalcedony, testifying to the action of water, lie about in wild confusion, mixed with equally large bowlders of lava, volcanic cement, tufa and breccia. The hills which give the name to Red Rock canyon are formed of layers of white, red and gray sandstone, covered with layers of white and pink tufa and volcanic cement, the whole capped with green and black lava.

The question, "Where does the gold come from?" is not to be answered off-hand. Several theories present themselves, but none have as yet been proved absolutely and unquestiouably correct. The presence of large granite bowlders, washed sand and gravel, points to the pre-existence of an ancient mountain torrent, or possibly glacial action, while the lava, tufa and scoriæ are of more recent origin. Their flow had its source iu the Black mountain, an extinct volcano of the greatest interest to even the casual observer and much more so to the student. On its steep and rugged summit, covered with volcanic slag, lava and obsidian, may still be seen the crater, now cold and dead, but once the scene of most violent activity, belching forth masses of smoke and scoriæ, and streams of flowing lava.

As stated before, the gold-bearing formation may be traced from the summit of the Tehachapi mountains to that of the range east of El Paso peak, if not farther. Throughout this region washed bowlders, such as are ordiuarily met with in the beds of mountain streams, washed gravel and sand, are found on the highest peaks, as well as in depressions, gulches and valleys. Basing upon this the theory that we have before us an ancient river bed, the occurrence of placer gold is readily accounted for. The situation would then present itself as follows:

The bed of the aucient river was by seismic or volcanic action raised above its original level; at a later date a volcano—Black mountain—broke through it, breaking it up and scattering part of it mixed with its glowing scoriæ and lava. After this upheaval, yet another catastrophe took place and water once more gaiued its lost supremacy in consequence of a wide-reaching depression, signs of which may be observed along the southeastern slope of the Sierra Nevada and the lay of the country in general. This submersion would account for the secondary wash, composed of parts of the ancient river bed and rocks contemporary with it and the more recent volcanic products. It is a fact much commented upon by old placer miners, who, after years of experience in the northern aud central counties of Califoruia, were attracted to the new discoveries iu the desert, that part of the gold found here differs widely from that usually met with in placers, in that it has all the characteristics of having been melted. This remarkable and extraordinary fact is quite consistent with the theory advauced. When the volcauic eruption took place the intense heat melted, uot only part of the placer gold originally contained in the ancient river, but also such as was contained in bodies of auriferous ore, which, as for instance at Goler, may be observed in dead and burut-out quartz ledges.

About ten miles northwest of Red Rock canyon are the so-called Mexican mines. On two of the claims, San Francisco aud San Clemente, prospect shafts have been suuk on a ledge of considerable width. Some very rich ore was found in pockets near the surface, while the ore at a depth of thirty feet assays about $25 per tou.

The Lower Goler camp is near the moutb of Goler canyon, and the diggings are deeper than at Red Rock. Once melted, gold predominates, and it carries more silver than in the former locality. Thirty-four ounces of gold taken out of the Jackass claim contained two and a half ounces of silver.

While at the Upper Goler camp conditious similar to those at Red Rock prevail, the Lower Goler placers present a somewhat different character, there being less signs of the ancient river wash. Burned-out ledges point to the possibility that from them was derived part of the gold. The gold varies in fineness from .885 to .925, while selected lots run as high as .985. R. G. and A. F. Willard located on February 24, 1893, the Jackass claim, and average $250 per month. Their claim is up a side gulch and shallow, being from two to six feet deep. The dirt proves richer ou top than ou the bedrock.

About thirty men with eleven dry washers are engaged in mining in this canyon, aud average $3 per day, with the exception of Benson's outfit, where teu meu are at work and are said to average $10 per day.

Gold was first discovered at Goler by Ramsey Cox of San Bernardino, who was out hunting coyotes for their scalps, some time betweeu Christmas '92 and New Year '93. Sufferiug for the want of water, he went up this canyon until he found a water hole, where he horned out some of the dirt and found gold. He located a claim and called it the Horn Spoon. On his return to San Bernardino the discovery became known, and the first great rush was in February, '93. In September, '93, a nugget weighiug approximately $1000 was found on the Sau Turtle claim, which brought on a second rush to the mines during the months of September and October of that year. Since then, matters have settled dowu to a business basis and steady work.

These diggings are the most peaceable ever known; none of the usual adjuncts of mining camps, without which some people caunot imagiue them, are to be found; no saloons (with the exception of Red Rock), no gambling, no deaths by violence, no lawless element and no Chinamen—as peaceable a community and as hard working a lot of men as can be fouud anywhere.

Where the gold-bearing stratum is deep, as in the lower parts of the gulches where they open out, shafts and incliues are sunk to bedrock and the pay dirt is extracted by meaus of windlasses or wheelbarrows. Some of the works are quite deep, the deepest shaft being 174 feet down. There are in all about half a mile of drifts. Higher up the gulches, where the dirt is more shallow, dump-scrapers are employed in excavating.

The road from the Lower to the Upper Goler camp —two miles apart—is very rough and rocky. There are about twenty-five men working at the upper camp, including those iu Nugget gulch, using twelve dry washers of different patterns. At this place from fifteen to eighteen tons is considered a good day's work with the best of machines, and the average output is from $2.50 to $3 a man per day. Current wages are $2.50 per day, or $2 and board, in this as well as the other camps. Work with dry washers does not require experienced miners.

Summit, the uext mining camp, is eleven miles distant in a northeasterly direction. There is no regular camp at this place, the tents and claims being scattered over the country on both sides of the Borax road. Gold was first discovered in Summit district on December 9, 1893. There are now about thirty men at work with twelve dry washers, none of whom make less than $2 per shift, while some make a good deal more—from $6 to $10. The average is about $3, the same as the other camps. In Fairy Gulch gold is found in a hard cement of gravel, magnesia and lime, overlying which is a layer of waste from four to five feet deep.

At the Lookout claim the owners work with a dry washer of their own construction and average $8 per day. The pay dirt here is the usual volcanic wash and the gold mostly fine. There is another volcano two miles to the northeast where small rubies are found. The gold-bearing formation is very extensive, but the gold is scattered in patches and pockets. Should this territory ever become too poor for white men—that is to say, should the output sink below $1.50 or $2 per day—Chinamen will probably come in as they have done in other parts of the State.

Summit, like Lower Goler, is a dry camp, and water has to be brought from springs six miles away.

Settled Satisfactorily.

On the early train this morning W. C. Ralston Jr., president of the Osborn Hill miue, aud also secretary of the State Miners' Association, arrived in Grass Valley, the object of his visit being to iuquire into the condition of affairs as they existed at the Osborn Hill mine, and to meet a committee of the miners' union and to come to such agreements as could be mutually made. The committee from the union consisted of George Stacey, president, M. J. Owens, M. M. Mitchell, J. F. Sullivan, Philip Tresize, William Roberts, Charles Hosking and James N. Richards. The gentlemen met at the office of A. B. Dibble and talked matters over iu a quiet and peaceable manner—in fact, both sides were more than pleased, and the miners were so satisfied with the gentlemanly way and kindly spirit with which Mr. Ralston accepted their terms, that they speak with the highest appreciation of that gentleman.

On the other hand, Mr. Ralston is exceedingly well pleased with the manner in which he was received by the miners.

The meu will go to work aud pursue their avocation just the same as has always been the custom. There will be no leugtheuing of hours and no company boarding house.

The boarding house will be kept up for a time at least, and all who wish to board and lodge there can do so. No compulsion will be showu. Mr. A. H. Schnabel arrived here this moruing, and he will resume the superinteudency of the miue. The meeting to-day was full of the most harmonious feeling, and each party is glad that they have come to understand one another better.—Grass Valley Telegraph, Sept. 21st.

Monazite Mining.

Miuing for mouazite is becoming an important industry in North Carolina. The miueral is worth six cents a pound at the mines, and is purchased as rapidly as produced by the Welsbach Incandescent Light Company of New York City.

Monazite is a phosphate of cerium, lanthanum, didymium and thorium. The oxides of these rare earths are used in the Welsbach system of incandescent gas lighting, in which their properties of glowiug with great brilliancy when strongly heated is utilized.

Monazite occurs as an accessory constituent of gneissoid and granitic rocks in certain regions iu North Carolina and Brazil, and at several localities iu Europe. It is mined, however, only in the sands of streams. Iu North Carolina it occurs in considerable quantities in small, brown, greenish or yellowish browu monoclinic crystals in the gold sands. The process of securing the mineral is similar to washing for gold, monazite being very heavy, sinking to the bottom of the pan or trough, while the saud and lighter particles are washed away.

THE Atchison, Topeka & Santa Fe Railroad Company has 7125 miles of line iu operation, the Southeru Pacific 6500 miles, the Chicago, Milwaukee & St. Paul 6083, the Louisville and Nashville 4700 miles, the Northern Pacific 4400 miles, the Chicago & Northwesteru 4300 miles, the Chicago, Rock Island & Pacific 3500 miles, the Illinois Central 2900 miles, the Pennsylvania 2500 miles, the New York Central & Hudson River 2100 miles, and the Baltimore & Ohio 1000 miles.

Money.

Many Roman tin coins are known to be in existence.

The gold coins of Great Britain contain one-twelfth alloy.

From 1828 to 1845 platinum coins were minted in Russia.

The United States silver 3c piece was first coined in 1851.

The Spartans had an iron coinage, no other being allowed.

The Lydians were the first to coiu money, about B. C. 1600.

The English mint was established by Athelistane about 928.

In the tenth century there were thirty-eight mints in England.

The first coining machine was invented by Bruchner in 1553.

Aristotle says that "money exists not by nature, but by law."

The first colonial coinage was minted in Massachusetts in 1652.

The notes used by the Bauk of England cost exactly 1c each.

Julius Cæsar was the first man to put his own image on a coin.

The American cents of 1787 bore the motto "Mind Your Business."

Homer mentious brass money as in use B. C. 1184, among the Greeks.

The coinage of trade dollars began in 1874 and was discontinued in 1878.

The coinage of 20c pieces began in 1875 and was discontinued in 1878.

Brass money was coined in Rome by Servius Tullius as early as 573 B. C.

Herodotus says that Crœsus was the first sovereign to make coins of gold.

In 1503 the first English shilling was minted. It bore the King's image.

The most ancient coins are of electrum, four parts of gold to one of silver.

During the reign of Henry VIII, 23 to 25 per cent of coin metal was alloy.

Before the days of coined money the Greeks used copper nails as currency.

The first English laws against counterfeiting were issued in 1108 by Henry I.

In 1844 Napier's coin-weighing machiue was put in use in the Bank of England.

Silver was first coined in Rome in B. C. 269, when Fabius Pictor set up a mint.

The trade dollar was intended for use in commerce with China, India and Japan.

The United States mint was established in 1792 and at once began operations.

The first American coins were made iu England in 1612 for the Virginia Company.

In the fifth century before Christ refined copper was decmed as precious as gold.

Over 1000 series of Greek coins, issued by independent cities, are known to exist.

English sovereigns were first minted in 1489. They were called by various nicknames.

In 1631 the invention of milliug the edges of coins, to prevent clipping, was introduced.

At the beginning of the Christain era the relative values of gold and silver were as 1 to 9.

English coin was first made a legal tender in 1216. Before this rents had been paid in produce.

Wampum was adopted by the New England coloiusts in all their dealings with the Indians.

During the reign of Numa Pompilius, 700 B. C., an experiment was made with wooden money.

Tobacco and warehouse receipts issued after it was stored were both used in Virginia as money.

Paper money was first introduced by the notorious John Law. His issues exceeded £120,000,000.

The earliest Greck coins bore a lion or tortoise on the obverse and punch marks on the reverse.

The bronze cent aud two-cent pieces were first coined in 1864 and the nickel half-dime in 1866.

In the world's mints from 1850 to 1890 there were coined 9194 tons of gold and 81,235 tons of silver

In 1620 the first large copper coins were mined in England, putting an end to private leaden tokens.

Iu 1237 the English coined gold pennies which weighed 1-120th of a pound and passed for 20 peuce.

Vermont and Conuecticut coined coppers in 1785. New Jersey and Massachusets did the same in 1786.

In the early ycars of this century there were thirty-three tons of silver to one of gold in circulation.

From 1662 to 1690 the accounts of the New Netherlands were kept in wampum, beaver and raccoon skins.

The Romaus issued private or consular coins which bear the names of every leading Roman family.

Arabic coins have a sentencc from the Koran, and, generally, the caliph's name, but never an image.

The average life of a note of the Bank of England is a little less than 70 days. Notes are never reissued.

In 1840 Great Britain had £35,000,000 of paper money, in 1890 £39,000,000; at the former date France had £9,000,000, at the latter £115,000,000; Fustria had £80,000,000 and £123,000,000 respectively.

In 1000 ounces of our gold coinage there are 900 ounces of pure gold, 10 ounces of silver and 90 of copper.

Wheu Leyden was besieged by the Spanish army in 1574, the city government issued credit notes on leather.

The purchasing power of money in the days of the Roman Emperors was about ten times what it is at present.

During the rein of Victoria the Indian Government has coined £2,000,000 gold and £206,000,000 of silver.

The plan of a decimal coinage for the United States was suggested by Jefferson in 1785, and adopted by Congress.

According to Jacob's estimatc, the Roman Empire, in the time of Augustus, possessed £338,000 of gold and silver.

Cakes of tea in India, pieces of silk in China, salt in Abyssinia and codfish in Icelaud have all been used as money.

The early English and French kings took "moueyers" with them on their travels, who coined money as it was needed.

The American Indians used money tokeus made of coal, bone, shell, mica, cornelian, agate, gold, copper, lead and iron.

The first mention of money in the Scriptures was Abraham's purchase of a sepulcher for 400 shekels of silver, B. C. 1860.

The currency of the Argentine Republic consists altogether of paper notes, ranging in value from one cent up to $100.

A Roman mite was thirty-five hundredths of a cent; a farthing was sixty-eight hundredths; a penny 13 75c; a pound $13.75.

The famous "Wood's Money," which made so much trouble in Ireland and the colonies in 1722 and 1723, was made of pinchbeck.

Edward III ordered innkeepers to search all their guests in order that foreign mouey might not be brought into the country.

The amount of paper money issued by the revolutionary government of France between 1790 and 1796 is estimated at $9,000,000.

France has a currency of £178,000,000 gold, £150,000,000 silver, £115,000,000 paper—in all £443,000,000, or £11.3 per inhabitaut.

Among the South Sea Islanders, for a long time after their acquaintance with Europeans began, all values were expressed iu axes.

The skins of various animals passed current among the American Indians and were to a small extent adopted also by early settlers.

The continental money depreciated so greatly before the end of the Revolution that it passed current only at the rate of 1 to 40.

Germany had last year £122,000,000 gold, £45,000,000 silver, £71,000,000 paper—a total of $238,000,000, or £5 to each inhabitant.

Down to the Norman Conquest the Britons had "living money" and "dead money," the former being slaves aud cattle, the latter metal.

The United States coins fixed by Congress in 1786 were the gold eagle and half eagle, silver dollar, half dollar, quarter, dime and half dime.

Bariug says that in London during the crisis of 1847 it was found impossible to borrow any money whatever on a sum of £60,000 of silver.

During the fifty-five years ending 1890 India received and retained £442,000,000 of gold and silver, taking four times as much silver as gold.

The paper money issued by the first French Republic fell to less than one per cent. A pair of boots cost 7500 francs; a pound of butter, 750.

According to the best estimates, Great Britain has at prescnt £102,000,000 gold, £24,000,000 silver, £39,000,000 paper, a total of £163,000,000.

From 1638 to 1652 musket balls were used as currency in New England, at a valuation of a fathing apiece, and were legal tender up to one shilling.

The Roman æs, or libra, was a pound weight of copper or brass stamped by the State. It was oblong, like a brick, and was not struck, but cast.

The Director of our Mint says that the United States has $654,000,000 gold, $575,000,000 silver, $405,000,000 paper, or over $25 to each inhabitant.

Numismatists say that no human head was impressed on coius until after the death of Alexander the Great. All images before that were of deities.

The total amount of money issued by the Continental Congresses and the States to carry on the War of the Revolution was not short of $500,000,000.

Edward I forbade the circulation of foreign money in England, and established an exchange at Dover where travelers might dispose of or purchase money.

During the hundred years' war between France and England every barou in both countries claimed and exercised the right to coin what money he pleased.

During several centuries the deposits in the Bank of Venice, which were not payable, but transferable on the books of the bank, were at a premium over gold coin.

In the fifteenth century the Bishops and monasteries of Fraucc, England and Germauy did an extensive business in coining money under royal sanction.

Judas sold his master for thirty pieces of silver; that is, thirty Roman pennies, about $4.12½. One Roman pênny was a good day's wages for an agricultural laborer.

Two hundred ycars ago the West Coast Africans had a "money of account," the standard being a bar of iron, and anything supposed to equal its value was called a "bar."

In 1864 Charles II miuted tin and tried to make it pass current. After his abdication James II minted gun metal and pewter and endcavored to make purchases with the coins.

The North-English coined silver pence with a cross cut deeply into the coin, in order that it might be easily broken into halfpence and four parts (farthings) when small chauge was needed.

Madden says that in the British West Indies, two centuries ago, pins, slices of bread, pinches of snuff, drams of whisky, soap, cocoanuts, eggs and other common articles were all used as money.

A Jewish gerah was equal to 2.75c; a bekah was 27.37c; a silver shekel was 54.74c; a manch was $27.37½; a kiddar, or talent, of silver was $1642.25; a gold shekel was $8.76; a gold talent, $26,280.

The total coinage, gold and silver, of the reign of Henry III was £3898; the total coinage of the reign of Victoria up to 1892 was £544,100,000, of which £312,300,000 were gold and £231,800,000 of silver.

Precious Minerals in Siberia.

The best known part of all Siberia where precious minerals are found is the Transbaikal territory. Here, between the rivers Onou and Onou-Borza, rises the granite mountain Adun-Chilon, celebrated for the frequent discovery there of precious colored stones, such as topaz, beryl, aquamarine, Siberian topaz and others. Ou the Ouou, eighty-five versts from Nerchinsk, are found garnets in small crystals. Lapis lazuli occurs in the Baikal mountains, along the rivers Talaya and Sliudianka, flowing iuto the Baikal, and along the stream Malaya Bystraya, a tributary of the Irkut. In the latter locality lapis lazuli of good quality forms pockets in the large crystallized dolomitic limestoue, near its juuction with the syenitic granite. In the '60s pieces of lapis were worked here three poods in weight, or 108 pounds. From these deposits was obtained the lapis lazuli which served for the veneering of the columns in the St. Isaac cathedral at St. Petersburg and for the execution of a mass of artistic productions placed in the imperial palaces. In the same locality where the deposits of lapis lazuli occur, dark-red garnets are met with in crystals attaining two inches in diameter, and along the Bolshaya Bystraya amazon stone, sphene and feldspar of a crimson color are found; along the Talaya, mica, serpeutine, talc aud other minerals; along the Sliudianka, blue calcareous spar, white marble, rose-colored quartz, garnet, asphanite and others; and in the valley of the Uluntui, black mica in plates two feet in diameter. Pebbles of nephrite are found by the river Bielaya, which falls into the Angara fifty versts below Irkutsk, and along the Iret and Onou, tributaries of the Bielaya. Here pebbles of this mineral used to be found weighing as much as thirty poods. The Altai mountains, on the other hand, have become celebrated for their porphyry and jasper of various colors, which are forwarded from the Korgon ridge, from the banks of the Charysh and Alei, and from the vicinity of the Ridder mine to the Kolyvau polishing works, whence manufactured articles are dispatched over four thousand versts to the imperial court at St. Petersburg. At these works a mass of remarkable works of art have been turned out which now embellish many of the imperial palaces. Among them is the jasper vase placed in the hermitage at St. Petersburg, the oval cup which has a diameter of twenty feet. At the present time no fewer than eight quarries are being worked in the Altai, producing porphyry, blue and green jasper, granite, white and colored marbles, breccia, smoky topaz, red, rose-colored and blue quartz, agate and chalcedony.

BUSINESS is reported to be steadily improving iu the Cœur d'Alene and encouraging news comes from the mining industry in that section. The Mammoth mine at Mullan started up last week and is employing a large number of men. The Poormau at Burke is running along smoothly and makiug regular shipments. Two hundred men find employment there.

THE Cochiti, N. M., mining district is represented to possess quartz ledges fifty feet thick, assaying $40 to the ton, free-milling ore. The Spanish laud grant is a present damper to needed outlay, but it is thought the Land Court will curtail its claims next month. Bland, the metropolis of the district, is six months old and no one has beeu killed there yet.

HENRY W. LINDSAY, superintendent of the New Citizens' mine, Madera county, has been arrested at Fresno and taken to Madera on a charge of perjury in misrepresenting to Charles A. Lee of Plainfield, N. J., the output of the mine and the result of assays.

Gyratory Rock and Ore Crusher.

(*Continued from page 193.*)

not held by the two bolts to the brake hub; this is the safety device to guard against the destruction of valuable parts of the crusher by careless workmen allowing steel sledges or crowbars to drop into the hopper. Should the crushing head come in contact with anything of an unbreakable nature, the strain would become so great at the pulley that the bolts would be stripped of their threads and allow the pulley to revolve freely upon the countershaft. To the countershaft is attached the pinion which drives the large gear in the bottom, and to this large gear is attached a brass eccentric bushing, the throw of which varies from five-eighths to one inch and one-eighth, according to size of the machine. The lower end of the heavy upright shaft rests within this eccentric and gyrates with it. The upright shaft is suspended in the center by means of the ball and socket below the crushing head, the center of the ball being the fulcrum. To the top of this upright shaft is attached the crushing head, made of very hard chilled iron. As the gear wheel and eccentric revolve, the upright shaft will receive a gyratory motion (not a rotary motion), and the crushing head will then gyrate within the chilled iron liner or concave, which is fitted within the outer shell so that it may be raised or lowered by means of the jack screws on the outside of the machine. This will regulate the size of the product and also take up the wear on the head and liner.

The crushing head has the greatest motion at the top and the least motion at the bottom. This movement produces a most uniform product, spawls not being able to pass through without being broken. This crusher is adapted for fine crushing, as the crushing head can be set up very close to the inside liner or concave, there being very little motion at this point. Provision has been made for easily renewing the wearing parts. The machine is heavily built throughout and well proportioned to stand the heavy strains it is subjected to.

Advertising Catechism.

When is a good time to advertise?
Now.
When would you stop?
Never.
How much money would you expend?
A little more than you think you can spare.
Is that not putting it too strong?
No.
Why?
Because good advertising once begun increases your bank account, so that you can afford to double and treble your newspaper space.

Has not too much advertising sent many merchants to the wall?

Judicious advertising has never been the cause of a business failure, but it has been the cause of princely fortunes. Wildcat, indiscriminate advertising, coupled with loose business habits, has accompanied men into assignments. No modern store has ever made a big success that did not engage newspaper publicity.

The cross-examination is over.—Progress.

THE banks of the Payette, Idaho, are lined from Emmett on up with men rocking for gold and making from one to four dollars a day. The best dirt will be found when the river is at its lowest stage, the miners following down the receding water with their rockers. Several different kinds of rockers are used, some having copper plates, some burlaps, some blankets, etc. Like the Snake river product, the dust is so fine that considerable of it is lost. It is so light that a grain of it apparently as big as the head of a pin left in a pan to dry will float when water is poured in. A spot may prospect well this year, and be far richer or give up nothing the next. The high water deposits the lighter particles on the banks and bars, while the heavier is left here and there on the bottom of the river. It is on this theory that steam dredges were introduced on the Columbia, and their success led parties to commence preparing to give it a test at Marsh, ten miles above Emmett. The company is now hauling the lumber for the purpose of building dredges, etc. They say, however, that the ground which they recently bonded prospects well enough to justify them in taking hold without working the bottom of the river.

THE Mercur, Utah, Company has declared its regular bi-monthly dividend of $25,000, payable this month. This is the sixth dividend declared by the company, and makes an aggregate of $150,000 distributed among the stockholders. The *Record* says there is ore enough in sight in the mine to guarantee many more dividends.

THE smelters for the Boundary Creek district will be erected on the Colville reservation, on the American side, in consequence of the heavy duty on mining machinery.

Senator Jones of Nevada.

John P. Jones is attracting renewed attention by recent political utterances. He has had an interesting and prosperous career. He came here from Cleveland, O., in 1850, worked as a laborer in the custom house, then with his brother prospected along the Feather and Yuba, then turned his attention to quartz mining. During the time of his placer experiences, Jones was a resident of Marysville and his associates at a boarding-house there were Stephen J. Field, afterward Associate Justice of the Supreme Court, and George H. Gorham, for a long time Secretary of the United States Senate. In the house next to the one in which Senator Jones lived was a family named Murphy, one of whose members was a rosy-cheeked girl. Old Murphy used to correct this girl with undue harshness, until the matter became a subject of comment with the boarders next door, and one day Gorham remonstrated with the father and the old man moderated his style a little. This Murphy girl afterward married William Sharon, one of the Comstock owners, and her daughter became Lady Hesketh.

The most fortunate part of his life began when he went to Nevada to act as superintendent of the Crown Point and Kentuck mines. At that time Mackay and Fair had bought for a small sum several little mines on the Comstock, which no one thought of much value. When they struck their world-famous bonanza there he had already a bonanza in the Crown Point, and was a very rich man. The Crown Point was the southern end of the Comstock, but it was not the richest part of that lode. John W. Mackay took out $45,000,000 from the Comstock consolidation; James G. Fair's profits footed up $35,000,000, and J. C. Flood and W. S. O'Brien received $30,000,000 and $16,000,000, respectively, for their shares. Sharon made $16,000,000 in the Comstock, and W. C. Ralston and D. O. Mills made about $6,000,000 each. John P. Jones came in between the highest and the lowest of this group of Comstock millionaires. His Crown Point profits were about $10,000,000. The Senator has always been of a speculative turn of mind, and he took his big profits in Crown Point and invested them in other properties. The result was that he lost his first fortune very quickly. But he had retained his control of the Crown Point mine, and he soon took enough out of that to put him on his feet again. He had made and lost two fortunes, when he was elected to the Senate, in 1873, and he was then reputed to be worth $5,000,000. Five years later—in June, 1878—he was virtually a pauper by speculation. He owned any quantity of mining property in Sierra Nevada, but it was thought to be exhausted. No gold had ever been found in these mines below the 1800-foot level, and the general belief was that none was to be found. Harry Jones, the Senator's brother, now dead, had faith in the lower workings, and he went down to the 2100-foot level. His persistence was rewarded by the discovery of a vein of gold richer than any the mine had shown. The find was made in September, 1878, and the Senator's stock, which had been knocking about the New York market, a football for the brokers at $4 a share, suddenly jumped to $220—an astonishing advance. The new find made the Senator again a rich man. He then acquired a large interest in some gold mines on Douglass Island, Alaska, and when his Nevada property gave out again he found another fortune in the Alaska venture. His income from his Alaska investments was said at the time to be $12,000 a month.

WM. A. G. BIRKIN and Frank A. Youd, English mining operators, left this week for Loudon, after closing a mining deal with our townsman, M. M. Freed, for a group of gold properties, situated on the Big Hole river, in Madison county, about twelve miles from Melrose, says the Dillon (Mont.) *Tribune*. The price agreed upon is $425,000. The first payment of $20,000 is due in thirty days. One of the points in the agreement is that a forty-stamp mill be immediately erected upon the property and that $100,000 be expended in development work, which shall include the erection of mills and their equipment with machinery, electric light plant and all other necessary buildings. This is one of the largest mining deals ever consummated in Montana. It has been developing for nearly a year, and most of the negotiations were carried on by cable, one of the minor items in the matter being a bill of $1500 for cablegrams alone. Messrs. Birkin and Youd, who looked after the English end of the bargain, represent one of the richest mining syndicates in England. The title of the new company is the Madison County Gold Mining Company, Limited.

GOLD is reported to be plentiful on the Fraser this season, in consequence of the recent floods. Hundreds of Chinamen are washing the bars, and an attack of gold fever has sent several men from New Westminster up the river.

MR. CREEDE is reported to have sold the remainder of his interests in the Creede, Col., mining properties to D. H. Moffat for $5,000,000.

Copper in Idaho.

In a short time Custer county will be producing copper bullion, says the Challis *Messenger*. W. A. Clark, the great Montana mining man, has secured 51 per cent of the stock of the Idaho Copper Company, whose property is located near Huston, on Lost river, Frank Brown holding the remainder and continuing as superintendent of the property.

A forty-ton smelter will be running in about thirty days, and if the results are as anticipated a great plant will be put in. The company has given orders for transportation of coke and is making every preparation for a run.

This copper vein is sixty-five feet wide and is known as the big copper. There is said to be enough good ore in sight to run a forty-ton smelter for two years. A shaft is to be sunk on the vein at once to the depth of 300 feet. In addition a tunnel will be started on the other side of the hill following the vein in. This tunnel will be 3000 feet long and will open the vein at great depth. The ore carries from $8 to $10 in silver per ton and some gold.

All the old producing mines on the South Fork and its tributaries, except the Hunter, Morning, Black Bear, Custer, Sierra Nevada, Last Chance and Stemwinder, are working. They employ something like 1000 men underground and in the mills, divided as follows: Bunker Hill and Sullivan, 350; Poorman, 200; Gem, 255; Frisco, 120; Tiger, 80; Standard, 45; and Mammoth, 20. The Morning was to start up on the 1st. This would give employment to another 100 men underground and in the mill. The Hunter will also start up. There is some talk of the Custer also being again put in shape. The California on Nine Mile, near Menarch, is shipping ore under lease. This mine was a steady producer in the early days of the camp. The resumption appears to be permanent, and several pay days will promote good feeling and business enterprise among all classes. No county in Idaho ought to show more prosperity than Shoshone, better known as the Coeur d'Alenes.

J. D. HELM came in yesterday from the Vulture, says the *Courier*, where he has for some time past been successfully working the tailings of that old mine. Mr. Helm confirms the report of the rich gold strike below the site of the lower Walnut Grove dam. The strike was made by a Mexican. The mine is developed by a hole only four feet deep, exposing a ledge two feet in width. Nuggets of pure gold have been taken from the ledge, ranging in value from $30 to $200 each. The rock is fabulously rich. The hole is guarded day and night. The claim takes in a side gulch, in which the Mexican allowed a few of his relatives to try their hands at placer mining, and they in a short time took out several thousand dollars in handsome gold nuggets, and are now on a glorious drunk.

PRES'T COMSTOCK AND PROF. FORBES of the University of Arizona are geologically inspecting central and northern Arizona and tracing the mineral-bearing reefs that traverse the Territory from northwest to southwest, especially the barrier reef, of which the Mogollon rim is a part, and which serves to separate Arizona into two well-defined regions of low land and elevated plain. The result of these investigations will be compiled and published next winter.

THE smelter on the Big Bug mine, Arizona, owned by the Commercial Mining Company, is to be moved to the vicinity of the Senator property, on the Hassayampa, to treat the rebellious ores of that mine and do custom work. The plant is a big one and will entail much expense in its removal.

Personal.

W. A. KENT is the new chief engineer at the Anaconda and Syndicate, Montana.

JOHN FORD succeeds Heber Holman as foreman of the Gould & Curry and Best & Belcher mines.

CHAS. MCCREARY, an old and well-known mining man, passed away at Sacramento last Saturday.

MAURICE CLARK left here last Thursday to superintend smelting operations at the Malacate mine, Sultipec, Mexico.

MR. JENNINGS, of present prominence in South African mining enterprises, has temporarily returned from that country.

ISAAC HAZELGROVE, who has been prospecting in Calaveras Co. for a year, has returned to Salt Lake to enlist Utah capital.

CHARLES D. WALCOTT, the head of the United States Geological Survey, is now in Colorado overseeing the work that the Government has in hand there. He was tendered a reception by the Colorado Scientific Society at Denver last week.

Obituary.

HALSTEAD STANSFIELD SR., head assayer at the Treadwell mine, Alaska, died there on the 12th.

Scientific Progress.

The Pacific Cable.

During a recent visit to Canada Alexander Siemens gave to the press complete figures of the estimated cost, operating expenses and probable income for the Pacific cable connecting Canada and Australasia, which formed one of the objects of the Intercolonial Conference at Ottawa. The figures given have all the weight of Mr. Siemen's great authority in cable construction and the endorsemeut of other cable experts, and may be accepted as correct. It is seldom that complete figures on cable work are made public, and apart from the maiu result sbown hy the balance sheet, the details, of wbicb the bulk items are composed, reveal mauy interesting facts. The total length of the cable, about 8420 statute miles, would average $1000 per mile, of which the deep-sea portion would cost $1500 per mile and cable for sballower water $870 per mile. Two repairing steamers would be required, costing $500,000 each. Between New Zealand and Vancouver the cable would he landed at three islands, dividing it into four working sections, and the instruments and buildings for the staff would cost $150,000. The staff and office expenses at these five stations vary from $10,000 per annum at Vancouver to $30,000 per annum at Neckar and Canton Islands, where the employes have to be boarded and lodged, and in addition receive fifty per cent larger salaries, these islands heing mere rocks in the ocean, and, as Mr. Siemens mildly expresses it, "very undesirahle habitations." The chief items of repairs and renewals are 200 miles of cahle replaced per annum and tbe cost of maintaining tbe two repairing ships. Each vessel costs $3500 a month to keep it lying in port ready for business, and an additional $500 per day when it is actually at sea and at work, which it is estimated will he for ahout two months in the year. On one point no informatiou is giveu, and that is during what portion of the four months' cruising of the repairing steamers cahle communication would be actually interrupted, which would mean irretrievable loss to the revenue. The cruising time, no doubt, includes carrying supplies to stations, and if a fault develops gradually the cable steamers may be able to reach the spot, grapple and splice without any actual interruption, but with a sudden ground it might require more than a week to reach the spot.

Air Frozen Solid.

Prof. Dewar is attracting world-wide attention hy his remarkable series of successful experiments, in the Royal Institution lahoratory, where he has liquefied oxygen, solidified nitrogen and reduced air to a frozen solid at a temperature of 346° Fahr. below zero.

For years frozen carhonic acid was the limit in extraordiuarily low temperature, hut Prof. Dewar hegins where some of his predecessors ended in tbat journey toward "the absolute zero" that has so long heen looked forward to by explorers iu this department of science. Hydrogen is still successfully repellent to all efforts at the solidificatiou of that lightest of all gases. A generation ago Faraday advanced the theory tbat hydrogen was metallic. It has many characteristics that accord witb that tbeory. Tbe other theory that all metals are finally resolvahle into hydrogen, and tbat hydrogen is the one simple element, does not meet with any present favor witb scientists.

Cost of Salvage.

Enormous sums have beeu paid as salvage to the rescuers of ocean steamers when they are disabled at sea, and probably this is a more fruitful source of expense to the large companies than any other. On her first voyage the City of New York (as she was then called) ran ashore off Sandy Hook, and it cost the company $100,000 to float her off. In 1890 her sister ship, tbe City of Paris, broke her engines off tbe Irish coast, and was towed into port at an expense of $30,000 as salvage money. The City of Boston broke her sbaft in 1882, and it cost the company $46,500 to get her into port; and the Venezuela, of the Red D line, struck ou the Brigantine shoals off New Jersey in 1889, so that the company had to spend $40,000 to get her off. Tbe City of Richmond was towed into Halifax harbor in 1882 at an expense of $35,000.

The list could he largely extended, sbowing that the amount of salvage money paid for rendering services to disabled steamers at sea is so enormous that it almost equals tbe loss entailed by injuries to our woodeu vessels. The loss of life is less. It is quite rare that au ocean steamer is suhmerged beneath the waves so that the crew and passengers are lost, but when such an accident does transpire the destruction is appalling.

Lost Anchors.

Oue of the queer occupations of mankind is that of dragging for lost anchors. It is carried on iu hays and rivers, and even in the open sea along the coast. Several sloops and schooners are engaged almost exclusively iu this pursuit. The hunters are as familiar with the ground wbere anchors are to be found as fishermen are with the favorite haunts of the living inhahitants of the sea. On the Atlantic coast the stretch of sea off the Delaware breakwater is most fruitful in dropped anchors. This is owing to the fact tbat so many vessels are compelled by tbe state of the tide to ride off the breakwater, being oftcn caught in gales while stationed there. Tbe manner of fishing for lost anchors is most simple. A chain is let down in a loop long euough to drag along the bottom, and the vessel goes on her way witb all hauds on board alert for a bite, and a hite usually euds in a catch. The recovered anchors are usually sold again at a price of ahout four cents a pound, which is one cent under the market price for new anchors. A hig auchor will weigh 6000 pounds, so tbat tbe fishermen make $240 out of it. More ofteu, however, the anchors fished up weigh from 1000 to 2000 pounds, and there is a pretty profit in the business even then.

A NAVAL CORRESPONDENT who was present at a demonstration in England of the powers of the improved Maxim gun, speaks of it as being "a terrible exhihitiou of the murderous power of the new weapons." The storm of hullets from them cut the water like the rain on the advaucing edge of a tropical storm. With one of those guns a gunner of very moderate skill can at 500 yards range cut down an ordinary park paling almost as neatly as a workmau can do the husiness on the spot with an ax, and it is not, therefore, astonishing that the targets, small though they were, quickly "disappeared." Though be had heen present at every naval gunnery demonstration for many years, he had never seen such splendid shooting. He adds: "To the horrihle noise made hy a Maxim I know of nothiug that is comparable, except, perhaps, the sound made by steam blowing off at enormous pressure from the safety valve of a hig hoiler. Tbe water in tbe jackets of the barrels of the guns quickly hoiled, and the redundant steam was almost as conspicuous as the smoke from the discbarges."

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Aluminum by a New Method.

Aluminum, when it once forms an alliance with oxygen, is not so easily separated from it as most metals. An ore consisting mainly of oxide of iron may be burned in a furnace with charcoal, the carbon taking the oxygen out of the mineral, leaving a practically pure metal. Aluminum, too, is obtained for commercial purposes from an oxide (alumina); but that oxide cannot be reduced in an ordinary smelting furnace in the same way. The heat of an electric arc is necessary to effect the divorce. One of the best known methods of procuring the metal is to dissolve the alumina (in the form of purified beauxite, which is a hydrated oxide) in a bath of molten cryolite, just as sugar might be dissolved in water. The mixture is contained in an iron pot with a carbon lining; and this carbon is suitably connected with a copper conductor leading from a positive pole to a powerful dynamo. To complete the electric circuit cylinders of carbon, similarly connected with the negative pole, are immersed in the bath. The melted alumina is then gradually resolved, the oxygen going to the carbon cylinder, combining with it, forming carbonic acid gas, and escaping; and the pure metal sinking to the bottom of the bath. The process is continuous, more beauxite being dropped into the pot when the first lot is "reduced." Cryolite will hold in solution about 25 per cent of alumina, so that a larger charge than this cannot be worked at one time.

A new process is now reported from Neuhausen, Switzerland, one of the few foreign centers of aluminum production. It is proposed by a well known company in that town, already engaged in this industry. Electrolysis is again resorted to, but the particular mineral operated upon is a sulphide. The oxide is first converted into that salt, or rather into a double sulphide of aluminum and some alkaline metals like sodium. This particular combination is effected by heating alumina, carbon and sulpbide of sodium together. A bath of potassium and sodium chlorides, melted by external heat, is found preferable to one of cryolite for this process. It is claimed that less current is required to electrolyze this salt than beauxite; and as the cost of aluminum is really controlled by the cost of the electricity consumed in the operation, even the slightest gain in this respect is highly desirable.

Engineering Economies.

The great names which have adorned the history of engineering were of those who, having the constructive faculty largely developed, built, as best they could, that which was required of them, often insecure, often crude, often abnormally expensive, and yet often better than they knew. To these men the problem was not so much what a structure would cost, but to build a bridge which would not fall down, a dock which would stand the buffets of ships and waves, a structure which would be enduring and serviceable alike. How well they have succeeded the monuments which they have left to us attest.

"It is with all reverence and humility," says a well-known writer, "that one should speak of those who, by the boldness of their genius, astonished the world, and who set an example of problems solved and work done with facilities sufficiently inadequate to daunt the boldest at the present day. To these men," he says, "the certainty and accuracy of their calculations as to the strength of a beam was of far more importance than its cost; the strength and distribution of the strains of a bridge were of far more moment than the relative economy of different styles of trusses."

To-day we are met by an entirely different set of conditions. One can buy, by the yard, strain sheets of bridges, roofs and other framed structures of all kinds and for all conditions of service; for a few dollars a full set of designs can be had for different types of locomotives; the strength of materials bas been carefully worked out, and books can be had for the asking, giving the strength of beams, girders, etc.; the efficiency of prime movers has been carefully determined, and the data thereon can be readily obtained. One does not now design a turbine wheel or a steam engine unless directly in that business, although one may thoroughly understand the subject; but, looking up the result of tests, one selects the engine best adapted to the work to be done, and goes to the manufacturer for the outfit complete. The question now asked is, not if a process can be devised for accomplishing certain results, but which of a number of methods is the best, and by the best is meant the most economical. Many an elaborate plan and many a well-laid scheme bas fallen because of the commercial element having been entirely neglected or not thoroughly understood.

Restoring Strength to Iron.

Some time ago a railroad bought six new switching engines that were put into the same hard service in a yard where there was a great deal of running over switches and frogs that subjected the running gear to severe shocks. The engines were all of the same pattern, strongly built, with unusually heavy axles, the designer believing in a good margin of strength. After these engines had been in service for several years, one of them broke an axle. An inspection of the fracture showed that what was originally fine fibrous iron had become coarsely crystalline, the molecular change, no doubt, having been induced by the constant jars. Within six months all the six engines failed with broken axles, and the fracture in each instance showed the same condition of the iron. The superintendent of motive power of the company, when the breakages happened, believed that reworking restored the strength to iron that had become weakened through use. He determined to put the theory to a practical test, so he worked up the broken axles into piston rods, crank pins, rod straps and other parts of locomotives that are subject to severe and complex strains. The metal was found to give excellent service.

To Desulphurize Iron.

The Saniter desulphurizing process is making headway in Europe. During 1893 some 16,000 tons of iron and steel were desulphurized by its agency in England, the economy obtained being satisfactory. Krupp & Co. of Essen have now taken up the process for the whole of Germany, after making an extended trial of it at their Westphalian works. It is considered that the application of desulphurizing, in conjunction with the basic process, will bave considerable influence on the iron trade by enabling the impure native ores to be utilized to a larger extent than they are at present. All three applications of the Saniter process are now regularly at work, and with satisfactory results. The ladle process for desulphurizing crude iron, by which iron containing up to thirty per cent of sulphur can be dealt with, has, after two years experience, been so perfected as to give great regularity of results at a very low cost, and, it is added, basic iron is being manufactured by this means, and without the use of manganiferous ores from tap cinder.

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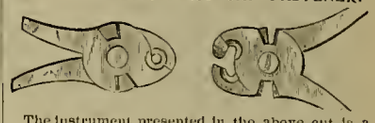
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This work, like Mr. Aaron's former publications ("Testing and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular," is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.
Table of Contents:—Preface; Introduction; Implements: Assay Balance; Materials: The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging: Assay Litharge; Systems of the Crucible Assay: Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead: Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MINING NOTES.—*Ledger:* Timbers are being hauled to the Good Hope mine property to commence development work.

J. L. Sargent started up the Farrell mill on rock he and his partner took out of the Farrell mine during the past month.

There are three men at work on the Bright mine cleaning out the old shaft and getting ready to begin work for the new company which was recently promoted by the Reichlings.

John M. Wilson has resumed work on his mine near Drytown. The shaft is down sixty feet and everything is in first-class condition. Mr. Wilson has equipped the property in a first-class manner with a steam hoist and will push work as rapidly as possible.

El Dorado.

TEXAS HILL.—*Democrat:* At the Try Again mine an upraise has been made from their tunnel for air.

At the Deep Gravel mine a winze 98 feet deep is about completed to strike a body of rich gravel known to exist there.

At the Varozza mine rapid progress is being made with the tunnel.

The Olive claim is now producing richer gravel than has ever before been taken from that mine. The body of gravel increases in extent and richness as the work advances into the hill. The mill is kept running most of the time.

The Tockey mine is being worked regularly in good paying gravel, the bed being six feet thick. A mill is needed at this mine, as it is almost impossible to obtain the gold by sluice-washing.

Reed & Coffin have completed an air drift, and are now ready to take out gravel.

Los Angeles.

TO HAVE A SMELTER.—*Herald:* Los Angeles will have a smelter. Of this there is no longer a doubt. The partially constructed building, furnace and the like on the east bank of the Los Angeles river will be completed between now and the first of January. The company will be composed of Arizona mining men and Eastern capitalists. It will have a capacity of 400 to 500 tons a day, and the same ores that are treated at Denver and Pueblo will be treated here.

Mariposa.

Gazette: New mines are being located every week, and properties change hands or are bonded equally as often. It is upwards of twenty years since Mariposa has had as bright an outlook as she has now. If every citizen will stand in loyalty and, by speaking a good word for their county, encourage new people to come and farm our lands, work our mines and convert our forests into marketable lumber, our prosperity will rapidly increase, and we will soon rank among the leading counties of the State.

Merced *Star:*—The English syndicate who recently purchased the mining property at Whitlocks have announced their willingness to purchase power from the Yosemite railroad, and if the power is furnished, to erect a 500 stamp mill. The proprietors of the Cook mines and other mining properties in Mariposa county are also of the same mind. Mr. Wulkop and Mr. Hall are now in San Francisco in consultation with a number of people who are interested in seeing the railroad built.

Placer.

Sentinel:—A new quartz mine has been opened down in Rattlesnake district. A Y tunnel of 400 feet has been run by Porterfield & Zantgraf, which has tapped a fine ledge running parallel with the famous Zantgraf mine. A tramway has been built leading to the Zantgraf mill, and the work of taking out ore has been commenced.

At the Zantgraf quartz mine they are busy with further development and improvement of the mine. We understand that as soon as operations at Mammoth Bar close for the winter, water can be secured to run the Zantgraf mill. The Mammoth Bar is taking 500 inches of water.

Nevada.

RICH PROSPECT.—*Transcript:* Henry Trevaskis, at Indian Flat, has been running a tunnel into Red Hill for the purpose of striking a quartz ledge. After running 200 feet and not finding anything, he quit the tunnel and began sinking a shaft. After getting down about twenty feet he struck a small vein of decomposed quartz, of a reddish color, through which there was a narrow streak of very rich quartz. Trevaskis has been pounding up this rich rock in a hand mortar and in this way has made good wages. The other part of the ledge matter he threw to one side, not considering it worth working.

The other day George B. Treadwell, the well-known mining expert, stopped at Trevaskis' mine to see what prospects the former was meeting with. He noticed the red rock that Trevaskis had thrown away, and upon looking at it carefully gave it as his opinion that it would be a good idea to have it worked. The quartz contains considerable oxide of iron. Mr. Treadwell took a sample of the poorest of this quartz and sent it to his son in Amador county to be assayed. This morning he received a letter containing the result of the test, and also the gold button. The rock assayed $4,574.10 a ton. Were it not for the pockety nature of that section, moneyed companies would quickly take hold of this prospect. As he is working it Trevaskis is doing very well, and may develop a rich and permanent mine.

CONTEMPLATED SALE.—*Union:* It is expected that the Belle of France mine, which is situated near the North Star mine, will soon change hands. A number of capitalists have of late been examining the property. The Belle of France gives indications of becoming a good mine. An amalgamation assay of twelve pounds of the ore assayed $16.50 per ton, and the dirt and decomposed quartz from the hanging wall gave a return of $23 per ton. Walter W. Byrne, who is interested in the Belle of France and extensions, received a letter Friday from Messrs. Lane & Hayward's mining expert saying that he would be here in a few days to examine the mine for his company. Monday six men will start to work and run drifts, and take out 100 tons of ore for a mill test.

Trinity.

Journal:—Rouse, King & Co., have obtained the contract to widen the Canon creek ditch on the Hayes Mine at Junction City and also to build new flumes. They will begin work next Monday, and will employ a force of about 100 men.

The lessees of the Chloride mine on Canon creek have struck a two-foot ledge that will mill $25 a ton. The new strike is west of the old pay chute on the mine and promises to be more extensive than it. At present the mill is not running owing to the scarcity of water but will start as soon at the fall rains begin.

NEVADA.

THE ZIRN-SCHULTZ STRIKE.—Belmont *Courier:* Everybody is excited over the recent strike in the Zirn-Schultz mine in Pine Nut and many people from Genoa and Carson, and a few from a distance, have visited the mine. All who have seen it pronounce it the greatest strike ever made in this county. Messrs. Schultz and Zirn have made several trips to Carson in the past ten days taking in from $2,000 to $3,000 worth of gold every trip. The mine is guarded by two men day and night, and the ore is so rich that only a very few people have been allowed to see it at the mine.

It is now regarded as certain that this district will be systematically prospected and it is confidently expected that many paying properties will be developed. It is hoped that all who have taken up claims will work them, in some way. The Pine Nut hills are full of gold and a little systematic work will surely bring some of it to light.

A town site has been surveyed on the flat this side of the Zirn mine and everything is progressing favorably for a booming mining camp. It is probable that other rich discoveries will be made soon, and to this end all should put their shoulders to the wheel and assist in developing the district.

The amount taken to Carson by Zirn and Schultz is variously estimated at from $6,000 to $20,000, and those who have seen the mine say there are thousands more in sight.

A SCANT WATER SUPPLY.—*Enterprise:* Evan Williams of Empire, superintendent of the Mexican mill, in speaking of the prospects of starting up the Mexican mill for a permanent run, said that operations would be commenced next week, but that it depended entirely upon the water supply how long the run would be continued.

What Mr. Williams says is not particularly encouraging. Last week the mill started up on south-end ore, but could continue crushing for a day only, as the water supply in the river was then depleted. The farmers up the river with but two exceptions have all discontinued using the water. These two are still continuing to turn the precious fluid out on the sagebrush.

A litigation has been commenced against these two agricultural gentlemen, but as law is long, it is difficult to say definitely when the quantity of ore now at the Crown Point and other south-end mines can be reduced. As these mines will all start up as soon as the mill can resume work, the ebb and flow of the water in the river is watched with great interest by the miners who are anxious to resume work.

The stock market will also be greatly influenced by the resumption of work at the Mexican mill. Outside dealers like to see bullion being turned out. It is hoped that work will speedily be resumed.

A NEW MILL AT SILVER.—*Enterprise:* H. C. Biggs of San Francisco was on the Comstock lately. Mr. Biggs owns the principal interest in the Red Jacket mine at Silver City. He is having a mill built in California which operates on an entirely new principle. This mill will be erected in Silver, to crush Red Jacket ore. It is a series of mortars, the principle not being unlike that involved in the Kincaid mill which is in operation at the Occidental. Mr. Biggs is now at Silver.

MAY BECOME VALUABLE.—Elko *Independent:* J. E. Morris, who is interested in an extension of the Elko soap mine, brought in nineteen sacks of the stuff to-day to ship to the aluminum works at Los Angeles. Should the test to be made prove satisfactory, there will be a big demand for the clay, and the owners of the property may become millionaires before another year rolls around. There is a fair prospect that something will be done with the property, as the deposit carries a high per cent of aluminum.

PINE NUT.—*Tribune:* The strike in the Zirn-Schulz mine at Pine Nut continues to be the theme of conversation in Carson. The ore brought in by Zirn is on exhibition at the Arlington Hotel and swarms of people have been flocking into the hotel to-day to examine the same. Mining men from Virginia are astounded at the richness of the ore, and say that if there is any considerable body, Pine Nut will soon be a booming city.

Kennedy District.

C. A. Norcross is very enthusiastic over the prospects of the Kennedy camp. The mill has proven a gratifying success. He says there are about 450 mining locations and a great many are developed into good-paying ledges. The are 450 men in camp, a town hall, a two-story saloon, hotels and numerous other business houses.

SOUTHEASTERN NEVADA.—The Pioche *Lode* says: It is rumored that the consolidation of the P. C. Co. and the Nevada Southern Railroad Company has been effected, with J. R. De Lamar and H. B. Chaffin as prime movers, and, with other prominent Eastern capitalists, the work of pushing the line from Milford to Pioche over the old U. P. grade will commence at once and be completed before Christmas.

OREGON.

McKune & Co. are building a stamp mill in the Blue River mining district, 50 miles from Eugene.

Ten stamps will soon be added to the Moores mine near Baker City, a concentrating plant has already been added.

The Horseshoe mine, located on Wolf creek, has been leased to a company of practical miners for one and one-half years.

The management of the Baisley-Elkhorn mine will soon resume operations. They will put in a chlorination plant for working their ores.

Wm. M. Hannum has sold 80 acres of rich placer ground on Upper Grave creek, Josephine county, to Messrs. Davis & King of Medford, who will lay 15-inch pipe and fix for heavy pressure by the time fall rains set in. Upper Grave creek has long been recognized as rich in pay dirt, but it will take more or less capital to bring water on and lay the gold dust bare. Already fifteen tons of machinery are on the road to the grounds.

The Mollie Hill, situated on the summit of Mt. Reuben, Josephine county, has been sold to Jacob Kamm of Portland. The shaft that has been sunk to the depth of 90 feet, was started on ten in. of $40 ore, discloses at the bottom four feet of ore that will average $90 to the ton. This property will soon give employment to a number of men, as the owner intends tapping the shute 600 feet deep, which will require a tunnel 700 feet in length.

WASHINGTON.

CLEVELAND AND OLYMPIA.—Spokane *Review:* The purchase of the Cleveland and Olympia mining claims on Hunter creek, about fifteen miles northwest of Springdale, on the Spokane Falls & Northern, has been fully confirmed. The properties were first secured by Howard C. Walters under a three years' lease, with an option to purchase at any time during the lease at $150,000. This lease and option were then sold to a syndicate of Spokane people, who yesterday again sold and assigned to Messrs. MacAuley and Monaghan of this city and Coeur d'Alene. As the properties were examined by George B. MacAuley before the latter transaction, the sale emphasizes the seemingly extravagant statement hitherto made about these properties.

With practically no development a great body of galena ore has been disclosed in the Cleveland. The dimensions of the ore in sight are roughly stated at 10 by 25 by 100 feet, or perhaps 4,000 tons, averaging 30 ounces of silver and 30 per cent. lead per ton, and capable of being readily graded up to 40 ounces silver and 40 per cent. lead per ton.

BRITISH COLUMBIA.

NEW DENVER.—Nelson *Miner:* Mr. Finch has thrown up his bond on the Reid and Robertson, stating that he saw nothing in sight to justify any further expenditure on it. The people at Silverton and in a less degree at New Denver were needlessly discouraged at the news, because even if the Reid and Robertson vein has petered out there are numbers of other vast deposits of ore around and new finds are being made almost every day.

The owners thoroughly believe in their property and congratulate themselves on the $15,000 worth of work done on the mine of which Mr. Finch has now made them a present.

IDAHO.

IT'S ALL RIGHT.—Owhyee *Avalanche:* The Tip Top mill is running satisfactory. It is reducing about four tons to the stamp, or forty tons daily. Assays of the tailings show that less than $1.50 per ton is going out of their mill. Colonel Bryan says that when they get the other four vanners in position and double their copperplate surface, the mill will handle five tons to the stamp. The mill force, when everything is down to a regular basis, will require but three men on a shift—engineer, battery man and vanner man.

There is no question as to the unqualified success of the milling plant, and with this cheap and effectual method of milling the Tip Top mine is a great property.

DREDGING THE SNAKE.—*Tribune:* E. D. Roth and C. S. Davis of the Roth Amalgamating Company have returned from the Snake river placers, near American Falls, where they have been setting up two of their amalgamating machines. The machines, with boiler, engines, pumps and grizzlies, are mounted on a flat boat, and the bottom of the river is being dredged for the black sand that contains the flour gold. The two machines have a capacity of 220 cubic yards per day, and the run and cleanup was most satisfactory to Munn Brothers, the owners of the placers. Snake river gold has long been known as the most difficult gold to save, on account of its extreme fineness, but the Roth amalgamators saved it all on this run.

MONTANA.

Great Falls *Tribune:* One or two cleanups have been made the past week on some placer claims at Yogo. The miners report having made expenses, and several nuggets worth from 75 cents to $1 have been found.

Red Lodge *Picket:* The Clark's Fork gold diggings are still continuing to pay good wages under the present crude system of ground sluicing. Every cleanup made so far, in which the gravel has been washed in a proper manner, has shown good pay. C. W. Chowning has been systematically prospecting the ground with a view of putting in modern gold-saving machinery and has been more than satisfied with the results. A recent test of four yards of gravel yielded him $5, which is considered exceedingly good.

Virginia City *Madisonian:* A deed conveying from James E. Madison and wife, of Gallatin county, to the Baltimore and Montana Reduction Company the Golconda group of mines at Red Bluff, was filed for record with the County Clerk and Recorder this week. The consideration was $65,000. The articles of incorporation of the purchasing company, which is stocked for $300,000, were also filed.

SOUTH DAKOTA.

RICH YELLOW CREEK—$3,700 FOR 25 TONS. *Pioneer:* A. G. McShane and brother, of Yellow creek, shipped twenty tons of ore to the D. & D. smelter getting returns of $90 to the ton, or $1,800 for the lot. A few days later they sold thirteen tons of ore for $1,320. They have nearly completed another car of ore from their mine which they will ship to the same smelter to-day. They are working as fast as possible on this shipment of twenty-five tons and the smallest assay made from a mixture of the ore gives a return of over $150 to the ton. This country is on the verge of a mining growth that will equal any yet seen. Three months ago the ground on which this strike was made was not even thought of as mineral ground. Prospectors passed it by on their way to other fields to gather wealth and left these rich deposits to be discovered almost by accident. At present there is not a foot of ground to be had and discoveries of rock assaying from $25 to $150 to the ton are being made and kept quiet until the ledges are developed. The various plants in Deadwood and vicinity in three months will not be able to handle the ore that is now being uncovered in the Yellow creek and Bald Mountain country. Prospectors are at work in every gulch in the country and there are parties coming into the city here to purchase provisions who leave and are not seen for a week or two and they have prospects of ore that only the assayer knows anything about. Last week a discovery of ore was made and the ledge found just under the grass roots a little work disclosed a body two foot thick and three assays $26.90, $29.60 and $29.75 only six feet from the surface.

Black Hills *Times:* One of the owners of the Decorah mine informed the *Times* yesterday that work was indefinitely suspended owing to the demand of the Terry Miners' Union that none but union miners could work in that district, and that they should not work for less than $3.50 per day. The work so far done on the mine has been with pick and shovel, for which the men were paid $3 per day.

COLORADO.

LA PLATA DISTRICT.—Report received at Denver from the La Plata district, in Southern Colorado, where Senator Jones and his associate made extensive purchases last spring affirms the existence of a body of gold-bearing ore 700 feet thick and 2600 feet long. The ore is free milling and averages, $5 a ton.

J. W. Pender says the Baker contact is the largest ore deposit that has been discovered on the American continent. No engineer can figure how many tons there are in that great bank of conglomerate, but at a low estimate there are 7,000,000 or 8,000,000 tons, averaging $5 a ton.

The experimental mill which is being erected by the company, will be in operation within the next twenty days. A test run of twelve and a half tons of ore and it came from the vein cleaned up $10.91 to the ton.

The Baker contact is described as an oblong vault of conglomerate, 2600 feet long on the surface and containing dykes which were forced up from below ages ago. It is estimated that the actual cost of producing the yellow metal from the immense gold quarry will not exceed $1.40 a ton. This includes mining, delivering at the mill and cost of reduction.

THE ELKTON COMPANY.—At the annual meeting of the Elkton Mining and Milling Company the old officers were re-elected, the Board of Directors was increased from four to five, and William Shemwell elected to fill the vacancy. The report submitted by the treasurer shows that the mine has produced since last October when the first car of ore was shipped, about $95,000 worth of ore. Of this there was paid on leases, labor and other expenses about $60,000; $27,569 having been paid in dividends and $4,200 in cash on hand, together with five cars of high grade ore at the smelter.

THE EMPIRE MILL.—The Empire mill, says the Pitkin *Miner*, is soon to be started up by Cripple Creek parties, who intend to operate it as a custom mill. If the proper process is put into this mill, that will treat the gold belt ores successfully, it will be a great factor in returning prosperity to our district. There are many properties in our gold belt which have large deposits of low grade ore that could supply a mill continually with abundance of material.

HEAVY MINING DEAL.—Boulder *Camera:* Miles and Cæsar Grant and David E. Brash have sold to the Gold Mountain Mining Company of Iowa the General Weaver, Annex, Highland, Mountain Boy, Mountain King and other lodes for $1,500,000, the receipt of which in lawful money is acknowledged and confessed.

UTAH.

THE SMELTING SITUATION.—*Tribune:* The smelters, remarked a prominent smelter man, as yesterday he reviewed the situation, are at present operating at about one-half the capacity of a year ago, and employing but about two-thirds the number of men employed at that time. The only thing by which these conditions can be overcome is an improved market for the metals, and until that change comes he looks for no improvement.

At present the receipts at the smelters show the lead-silver ores and argentiferous iron ores preponderating, with Tintic, Bing-

ham and Frisco as the principal sources of supply. The receipts from these producing points yield a general average of about seven ounces silver and a high percentage of iron or lead, with those from Bingham carrying gold of the value of $2 or $3 per ton.

A slight increase in activity among the dry ores is reported since the reduction in the tariff on lead, although the companies owning bodies of this class will never consent to market in any quantity at present prices, which simply means a realization of about $40 a ton on ore the metallic value of which is 100 ounces silver per ton. There are some exceptions, say the smelter men, but they are isolated and are confined to such camps as Creede, where the cost of production is practically nothing as compared with those properties that must contend with water and maintain expensive pumping machinery.

The smelting men claim to have done all in their power for the relief of the producer during the present depression, and to have reduced the price of treatment to such a level that any further reduction would be the undermining of their plants. On silver-lead ores, on the argentiferous iron ores ferruginous ores carrying gold of the value of $2 they claim to have cut the price to the lowest possible margin, trusting that when the market improves the producers will reciprocate.

MERCUR DISTRICT.—THE GEYSER'S MILL: *Tribune:* The Geyser Gold Mining Company, whose properties are situated at Mercur, is rapidly perfecting arrangements for an active winter campaign. Mr. S. B. Milner went to Bingham yesterday, where he is putting up a gold mill which, under the agreement, is to be in operation by November 1st. The mill has a crushing capacity of 200 tons a day and a leaching capacity of 50, which, it is said, will be increased until it is capable of handling the product of the bonanza. The average value per ton is fixed by recent assays at $12.

A DOUBLE DIVIDEND.—*Tribune:* The Centennial Eureka Company threw a surprise into the mining fold in the shape of a double dividend, amounting to $1 per share, or $30,000 in all. It was a surprise because it was the usual monthly dividend twice multiplied. An unusually good run of ore accounted for the increase. The dividend was numbered 57 and 58, which indicated that in the nine years of the company's existence fifty-eight dividends of fifty cents each had been paid up to date. That is equivalent to a money aggregate of $870,000. The first five years of construction were accompanied by no dividend. It is therefore within a period of four years that the above amount has been paid. The ores of the mine are almost entirely of silver and gold, with very little lead.

ARIZONA.

The United Verde Copper Co., of Jerome, have 450 men employed in various capacities, and upon completion of the railroad, a correspondent of the Prescott *Courier* says, he is informed that the force will be doubled. This can easily be done, as the mountain upon which the mines are located is one solid body of mineral, varying to some extent in richness, but the whole can be worked at a profit. Improvements and additions are continually being made with a view to increasing the output of the mines, the latest being a converter which will convert the matte into copper. The converter will be completed and in operation in about two weeks.

RICH STRIKE. — *Republican:* Word is received of a wonderfully rich gold strike made by some Mexicans on the Hassayampa, two miles below Powell's camp, opposite the mouth of Fool's canyon and within rifle shot of the river. Nuggets weighing several ounces have been taken out of the ledge and there are about forty Mexicans engaged in taking out coarse gold in the gulch below the ledge. The ledge is well defined and consists of about three feet of a pay streak, in granite and porphyry. A miner who came in from that country yesterday says that he believes the find to be one of the most remarkable in the territory within recent years, and bids fair to excel the Harqua Hala strike.

STILL RICH.—*Miner:* The idea has gone forth that the mines about Mineral Park, Stockton Hill, Cerbat and Chloride have been dug out, and the district has received derogatory mention at the hands of parties who know little or nothing of what constitutes the sign of promising prospects. Some few sturdy miners have stood by their properties and steadily worked ahead, while from time to time new discoveries have been made. At the present time no district in the county can make a better showing, and the recent "strikes" made are astonishingly rich.

THE Riedler air compressor, installed by Fraser & Chalmers for the Milwaukee Mining Co., Idaho, affords a good lesson in steam economy, as well as an illustration of the success of the Riedler system. It supplants a smaller compressor of another make, and does twice the work on one-fourth less fuel, so that the cost of fuel is in round numbers as 2¾ to 1 for similar work between old and new plants. On the work done with wood at $3.50 a cord this amounts to $9000 a year, an actual reduction of fuel bill of about two-thirds.

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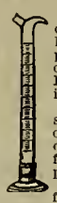

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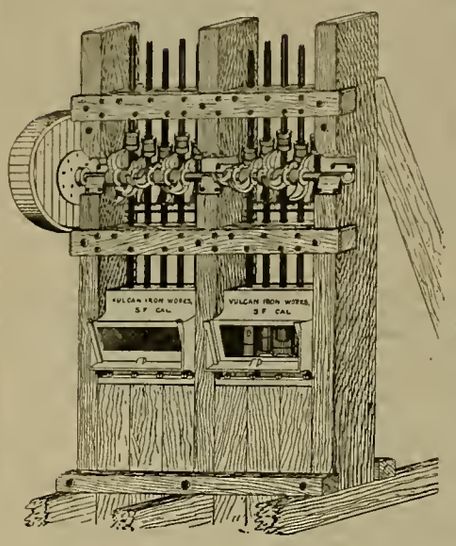

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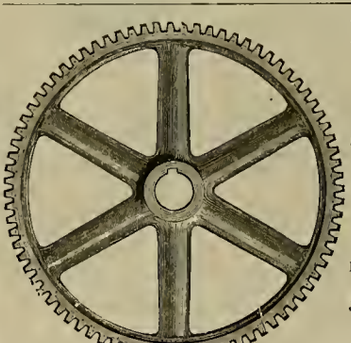

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Electrical Progress.

The Trolley Unnecessary.

The cntting of electric roof wires now going on under the supervision of District Engineer Wills continnes. Chief Sullivan thinks that he will not be enjoined; and while the work occasions loss to private corporations, he thinks that the pnblic good is of paramouut importance.

The underground conduit system of the Edison Company being confined to incandescent wires, it appears that the consequnent loss of cnrrent would prevent its application to the entire circuit.

The condnit system for operating electric cars is again reported solved, and conservative commnnities opposed to the trolley will, if so, be deprived of oue of the principal argnments against the advent of the electric street railway.

H. F. Peterson of Milwaukee, Wis., has a plan to divide the condnit into two compartments. The conduit is located wholly heneath the gronnd and is made in sections which can be closely wedged together, so as to form watertight joints. On the top of the casing is a longitudinal slot, the same as in the cable coudnit, for the pnrpose of admitting the contact-carrying device. This slot opens into one compartment of the conduit, and into this compartment all the dirt and water of the street is permitted to fall, but no damage can he done to the electrical conductors, as the compartment is separated completely from the one containing the conductors. Not only are the compartments separated, but the contact device has an arm which carries a steel broom. This sweeps the dirt and water which fall into the compartment to manholes, which can be located at convenient distances aloug the line.

The second or electrical compartmeut is covered with a flexible material, which is usually kept tightly closed, but which may hc opened by a pulley wheel, which is attached to the contact arm of the car. This compartment is located out of line with the slot, so that no water drippings can ever strike it; but even if they should, the cover at the top wonld carry them iuto the first compartment and they wonld be swept away hy the hroom. Within this compartment a constant circulation of air is kept np so as to prevent any moisture collecting on the walls, on the conductors or on the iusulated supports. This circulation of air may be supplied hy the moving of the cars or by a fan attached to the conduit at the power-house. The conductors in this compartment are not the ordinary trolley wires which may snap at any moment or be worn out by a little friction, but they are steel contact rails, which can he divided into sections of any desirable length. There are two of these rails iu the compartment, oue of which is charged with the positive current at the power-house and the other returns the curreut, so that none of the power is lost by leakage.

The contact rails are held to the sides of the compartment hy a strong insulating substance so as to be perfectly insulated from all other parts; fnrthermore the whole compartment is coated in the inside with a waterproof insulating paint. The main feeders to the rails are laid in insulated metallic pipes. Each section of the contact rails is conuected with the two main feed wires and is provided with a switch and cntout device, so that in case any trouble should occnr each section can be cut off and necessary repairs be quickly made without in the least interfering with the operations of the rest of the line.

The contact positive rail carries the power, aud this is transmitted to the motor on the car by a carrier which extends from the car through the slot into the first compartment. It is provided with a lateral arm arranged so as to bring its lower end into the compartment in which are the conductors. It is provided with two shoes which slip snugly over the upper portion of the contact rails and cannot by any accident jump off. A wire extends from each shoe through the hollow arm to the motor on the car. The positive wire carries the power to the motor, and it is at once carried hack again and returned on the negative rail.

It is claimed for this system that it will not only do away with the danger from fire which exists whenever the overhead trolley is nsed, but that it will also prevent all corrosion of gas and water mains which now snffer so mnch from electrolysis along the lines of electric street railways. The rail is not connected with and in no way receives the electric current, consequently the electricity cannot get into the ground and eat the pipes.

It is asserted that before many months a movement will he made in the ultimate direction of replaciug the cahle railway on Market street with electric cars.

The Steamer Northwest's Electric Equipment.

There are some very interesting matters in connection with the new steel passenger steamer Northwest, of the Northern Line, especially in reference to the vessel's nse of electricity, that have not been pnblished. In preface it may be said that on no vessel in existence is there such general use of the electric fluid as on this greyhound of the great lakes. When is considered the wonderful extension in the employment of electricity on modern ships of war aud on the latest Atlantic liners, this statement may seem almost a piece of iusular pride and prejudice, but it is made on authority that cannot be charged with such prejudice.

The vessel is lighted by 1800 incandescent globes, every one of which is hidden behind gronnd glass. This number, it is claimed, is 300 more than is in use in any of the Atlautic ships, even though the largest of them are 200 feet longer than the Northwest. The Campania and Lucania, of the Cunard fleet, embodying the very latest in marine development, have about 1350 lights each. The Northwest's lighting eqnipment is driven by three direct conpled engines, each dynamo having 600 light capacity. The vessel has electric elevators hetween the freezing rooms in the forehold and the kitcheus and cafe. She has electric signals everywhere. When the lookout, pacing the foredeck, sights a ship or wants to call the attention of the wheelhouse to any matter, he does not call ont, but steps to the rail and touches a button; immediately an answering ring assnres him that his signal has been heard and heeded.

As the vessel approaches her dock there is a noticeable absence of the usnal shonted orders from deck and bridge. It is all done by the electric bell, which was never known to swear or to be tempted to use langnage that would not he permissible in a parlor, something the man in charge of the deck has the reputation of doing occasionally. When the captaiu ou the bridge wants to give an order to the wheelhonse, or the engine-room, or the stokehole, or anythiug else, he merely turns to the second officer beside him, gives the order, and the latter presses a button. There are no less than six methods of signaling from the hridge to the different parts of the ship, and of these all bnt one are electric. The vessel's red and green side lights, than which nothing on the ship is more important, are not the universal oil lamps, but are high-power incandescent globes, and with them is a little instrnment that audibly records in the wheelhouse any accident that befalls the lights.

When the ship's big whistle is to he blown, instead of tugging at a whistle cord, the officer touches a button, and if it is desired that the whistle blow consecutive blasts at intervals for any desired length of time, a switch is turned. Not only is the whistle sounded, bnt on a continuons strip of paper is printed the time and dnration of every hlast, a record almost invaluable in cases of collisions in fogs, where conflict of evidence as to the proper signals is almost sure to arise. There are electrically driven fans in various parts of the ship, closets, kitchens and inner passages everywhere, hut these are particnlarly notable in and ahout the fire-rooms. Every one knows what an inferno the ordinary stokehole of a large steamship is from the descriptions that have often been given. In this part of the Northwest it is so cool that, with the fan aperture half closed, it is actually uncomfortable to stand uear the bunkers. So far from being naked demons in a little hell, the firemen actnally wear clothes. This is an innovation that ocean ship hnilders conld very acceptably follow. The ship carries a search light that will pick np a pilot boat letter 12,000 feet distant. There are many other novel features in tbe electric installatiou of this most modern of all the modern vessels, hut those indicated are the more interesting and new.

THE United States is by far the larger nser of electric light, but the methods of production and ntilization in nse here do not appear to be quite so economical as those practiced abroad, says an exchange. The plants throughout Europe are generally ou a mnch more modest scale than here, except iu a few snch cities as Berlin, Hambnrg and Vienna, yet recent statistics show that some of the smallest are competing successfully, not only with long-established gas works, but with petrolenm. Very little of the current, however, is used for power purposes, and couvenieuees like the fan motors now rnnning daily by the hundred thousand in the United States are well-nigh nnknowu, so mnch so that when needed they are shipped from New York. In Berlin 19.9 per cent of the current is employed in lighting dwellings and hotels, but in Hamburg the same item runs up to 38.7 per cent. Store lightiug in the larger German and Austrian cities averages 30 per cent of the current. Berlin and Vienna use much less than 10 per cent of the current for driving motors in factories, stores, etc. Exceedingly little use is yet made of the current for heating. A large proportion of the stations have storage-battery equipments; in this country this anxiliary is almost unheard of in central station operation, thongh nobody appears to know why.

RUPTURE!

It has beeu considered by the medical profession that heruia—commonly called rupture—was incurable, except by surgical operatiou, which is both daugerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 aud 87 CHRONICLE BUILDING, has opeued a uew field for research, and for the past year has beeu making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only whllo in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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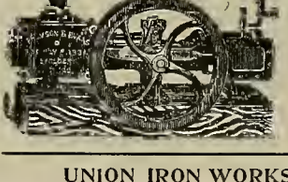

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Practical Information.

How to Remove Cinders from the Eye.

Nine persons out of every ten with a cinder or any foreign substance in the eye will instantly begin to rub the eye with one hand while hunting for their handkerchief with the other. They may, and sometimes do, remove the offending cinder, but more frequently they rub until the eye becomes inflamed, bind a handkerchief around the head and go to bed. This is all wrong. The better way is not to rub the eye with the cinder in it at all, but rub the other eye as vigorously as you like.

A few years since I was riding on the engine of a fast express, says a writer in the Buffalo *Evening Times*. The engineer threw open the front window, and I caught a cinder that gave me the most excruciating pain. I began to rub the eye with both hands. "Let your eye alone and rub the other eye" (this from the engineer). I thought he was chaffing me and worked the harder. "I know you doctors think you know it all, but if you will let that eye alone and rub the other one, the cinder will be out in two minutes," persisted the engineer. I began to rub the other eye; soon I felt the cinder down near the inner canthus, and made ready to take it out. "Let it alone and keep at the well eye," shouted the doctor pro tem. I did so for a minute longer, and, looking into a small glass he gave me, found the offender on my cheek. Since then I have tried it many times, and have advised many others, and never knew it to fail in one instance, unless it was something sharp, as a piece of steel or a substance that cut into the ball and required an operation to remove it.

Catch Questions.

A snail climbing up a pole twenty feet high ascends five feet every day and slips down four feet every night. How long will the snail take to reach the top of the pole?

A wise man having a window one yard wide and one yard high, requiring more light, enlarged his window to twice its former size, yet the window was still only one yard wide and one yard high. How was this done?

This is a catch question in geometry, as the preceding is a catch question in arithmetic. The window was diamond at first and was afterwards made square.

As to the first, perhaps it is scarcely necessary to point out that the answer is not twenty days, but sixteen, since the snail, who gains a foot each day for fifteen days, climbs on the sixteenth to the top of the pole and there remains.

A CINCINNATI MAN makes the following statement to a reporter for the *Enquirer*: "I was invited to select a tree, which I did, and it was cut down for me in the morning. I watched it during the day undergoing the various processes of paper-making, and at six o'clock that evening it was paper. At midnight a portion of it was sufficiently dry to be taken to a printing office, and a few of the copies of the next morning's paper were printed on this product. From a tree to a printed newspaper in twenty-four hours is probably the best time on record."

VERY great difficulty is experienced, even by the most skillful machinists, in removing the rusty rivets from the frames of locomotive engines. The master mechanic of a shop in Hornellsville, N. Y., a week ago Saturday, tried a new plan for this purpose. He fired a blunt-pointed drill from a small caunon upward under a frame, so as to hit a bolt squarely. The idea was a great success, and its application was continued.

ONE of the many industrial uses of photography at present is to illustrate new styles of boots and shoes, so that commercial travelers may take merely an album, and not a box of samples, when out on the road looking for orders.

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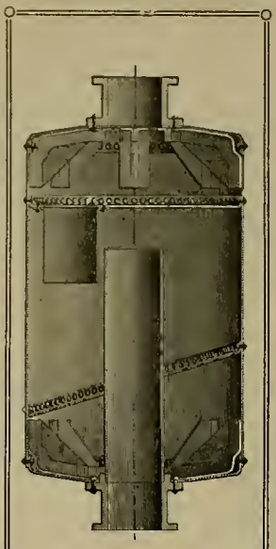

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WRITE FOR NEW PUBLICATIONS ON STEAM ENGINEERING.

THE primary object of transacting business, says a Chicago exchange, is is not to occupy one's time, but to make money. A great many people seem to lose sight of this end and imagine that if they are selling a large amount of goods or making a vast number of machines they are doing exactly the right thing. A salesman who can beat the house of Jones & Smith out of a large sale is usually commended, even though his firm loses money by the operation. Competition has become so sharp in almost all lines that the question of profit is lost sight of in the mad rush for business. To hurt a competitor is too often regarded as the same thing as helping one's self. Next to attempting to do business on insufficient capital, the practice of doing business for the sake of doing business is accountable for the vast number of failures of the present day. Customers secured through cut prices are hard to hold, since they are always looking for like concessions. It is better to sell a few goods and make a fair profit than carry on a "land-office business" at a net loss.

THE largest steel plate ever rolled in the world was turned out at Chester, Penn., last week, by the Wellman works. It measured 450 by 130 inches, and was an inch and a quarter thick. It is designed for the rudder-plate of one of the great steamships of the American Line now being built by William Cramp & Sons.

Over Four Thousand in Actual Use.

By referring to the advertisement of Jas. S. Brownell, on the sixteenth page, it will he seen that over 4000 Frue ore concentrators are in use. In the United States, and every mining center in the world where the concentration of ore is carried on, the Frue Vanner is recognized as the only machine that can he depended on to give universal satisfaction.

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Mr. Jas. S. Brownell, suceessor to Adams & Carter, is the western agent for the Frue Vanning Machine Co.; office, 132 Market street, San Francisco, Cal. Illustrated catalogue will he furnished on application.

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ONE IMPROVED BRUCKNER FURNACE, Revolving Screens, Self-Feeders, Rock Breaker, etc., etc.

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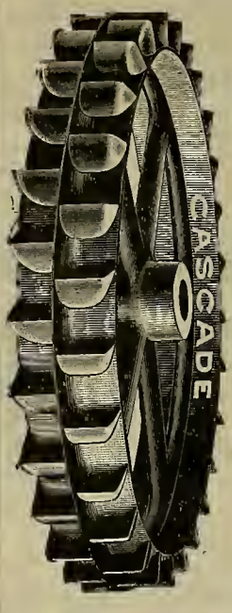

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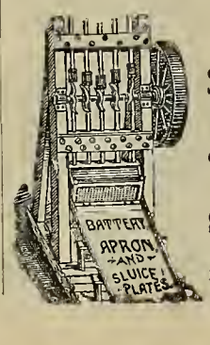

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Market Reports.

The Markets.

SAN FRANCISCO, Sept. 27, 1894.

The sanguine prophecies of silver's steady advancement are, so far, not in consonance with the facts. One month ago silver was 66; during the week it has revolved about 63¼. Low-water mark was, however, reached six months ago, when it weut to 58¾. Shipments aggregating nearly $1,500,000 were made from this city to China and Japan during the month; 400,000 ounces and 100,000 Mexican dollars were shipped from New York to England during the month.

Regarding the use of silver money by the Chinese, it is worthy of note that the Chinese system of currency is based upon a certain weight of silver, and not upon the number of a certain coin. Although the currency consists of "chopped" Mexican dollars—that is, the Mexican dollars are defaced by striking with dull-edged instruments—yet $1000 Hong Kong currency does not consist of 1000 of these defaced dollars, hut of 717 taels weight of them. If the coins are new, 1000 by count weight would be about 720½ taels, and 717 taels would consist of only ahout 995 pieces. The tael is equal to 579.84 English grains. Any one presenting a check or notes for $10,000 at a bank and wishing to receive coin would have weighed out to him 7170 taels weight of chopped dollars, consisting of 9950 pieces more or less. This system is said to he not so inconvenient as at first appears. Banking, hoth Chinese and European, is well developed in Hong Kong. Payments are nearly always made by checks or notes of the chartered or Hong Kong and Shanghai banks, the aggregate circulation of these notes being about $6,000,000, and there is a plentiful supply of subsidiary coinage of 50, 20, 10 and 5-cent pieces, which passes by count. Consequently Europeans and Americans, in their small private transactions by notes, checks and small change, manage to avoid altogether the weight system; in fact, many do not realize that it exists. But in large husiness transactions, such as balances between banks or shipments of coin to other places to pay for produce, the coin is always weighed out in the standard proportions.

The London *Times* says tbat, despite the ignominious failure of the syndicate which engineered the corner in tin in 1887, French and Dutch speculators are again trying to obtain control of the market. They are said to already hold about 16,000 tons of tin. The purchases have already caused a rise in price of $30 per ton. They have hoped that America would he obliged to have recourse to European markets, but, adds the paper named, they are likely to he disappointed, hecause America "could supply itself from Chinese merchants of the East Indies!"

An advance of $1 a flask is noted in quicksilver.

New York Prices.

NEW YORK, Sept. 27.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29¼	63⅝	....	....	....
Friday	29¼	63½	9 00	3 05	19 25
Saturday	29½	63¾	9 00	3 08	....
Monday	29¼	63⅝	....	....	....
Tuesday	29¼	63¼	9 12½	3 05	19 10
Wednesday	29⅛	63¼	....	....	....

The local hullion, money and exehange quotations eurrent are as follows:

Commereial Loans, ⅝ per annum	7@8
Commereial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½@
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63¼
Mexican Dollars, nominal	53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lh	—	@	11
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4½
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	5
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	18	@	20
ZINC.			
Sheet	8½	@	9
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 7 75		
Greta	7 50		
Nanaimo	6 25		
Gilman	5 75		
Seattle	7 00		
Coos Bay	5 50		
Cannel	8 00		
Egg, hard	9 50		
Wallsend	7 00		
Scoteh Splint	7 00		
Brymho	7 50		
West Hartley	7 75		
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scoteh Splint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Sept. 27, 1894.

Comstocks were huoyant during the week, Con. Cal., and Ophir, as usual, the center of attraction. Next Friday the Bodie Con. Mining Co. pays a 25 cents a share dividend, the first since April, '85. In one month (August, '78) that mine paid $400,000 in dividends. In the last three months of that year it paid $400,000 more. In '82 and '84 it paid dividends, and after many years gives its stockholders a pleasant suggestion of future possihilities.

The West Consolidated California and Virginia Mining Company has levied an assessment of 25 cents per share, delinquent Oct. 30th.

The following illustrates the changes of the week:

MINES.	20	27
Alpha	$ 12	$ 14
Alta Consolidated	....	30
Andes	59	70
Belcher	76	87
Best & Belcher	1 30	1 25
Bodie	1 50	1 35
Bullion	....	35
Challenge	40	55
Chollar	57	63
Confidence	1 10	....
Consolidated California and Virginia	4 30	4 90
Consolidated New York	....	05
Crown Point	....	87
Exchequer	....	....
Gould & Curry	....	85
Hale & Norcross	70	74
Justiee	22	26
Mexiean	1 35	1 65
Ophir	2 85	3 75
Overman	....	32
Potosi	70	82
Savage	67	76
Sierra Nevada	....	1 30
Union	76	90
Utah	....	09
Yellow Jacket	75	95

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 27, 1894.

FIRST SESSION—9:30 A. M.

200 Alpha	14	600 Mexican	1 60
250 Beleher	87	200	1 55
200	86	800 Ophir	3 55
200 Bodie	1 35	30	3 50
100 Best & Belcher	1 55	100 Overman	32
200 Challenge	55	100 Potosi	82
100	54	200	81
400 Chollar	63	100	83
250 C. C. & Va	4 75	500 Savage	74
950	4 80	100 Seg Belcher	25
600 Con New York	05	100 Sierra Nevada	1 30
200 Crown Point	87	350 Union	90
200 Gould & Curry	85	200	92
600	84	200 Utah	09
100 Hale & Noreross	74	600 Yellow Jacket	95
100 Justice	26	200	94
600 Kentuck	10		

SECONN SESSION—2:30 P. M.

600 Ophir	3 75	800 Belcher	89
200	3 80	100	88
400 Mexican	1 65	100	87
100 Best & Beleher	1 60	200 Utah	09
300 Con Cal & Va	4 90	500 Bullion	35
300	4 85	400 S B & M	27
300 Savage	76	700 Justice	26
400 Chollar	65	500 Alta	20
200 Potosi	82	400 Challenge	56
20	7	300	55
100 Hale & Norcross	75	300 Andes	70
600 Crown Point	89	100 Benton	65
600	90	200 Bodie	1 35
700 Yellow Jacket	96	400 Bulwer	13
400	95	600	14
600 Con. Imperial	03	300 Bonanza	25
1000 Kentuck	10		

Coast Industrial Notes.

—The State of Washington last year supplied 33 7-10 per cent of the coal landed at San Francisco.

—The rails and rolling stock have been hought to equip the Sierra Valley and Mohawk railroad in Plumas county.

—Samuel Blair has foreclosed upon the property of the Cedar River Coal Co. of Washington, to satisfy a judgment of $41,400 for money loaned.

—The water committee of Portland's City Counell has sold honds to the amount of $2,200,000, and has authority to sell another $1,000,000. Of the latter, $400,000 will he put on the market at once.

—Charles A. Wetmore, the wine-grower, has bought from F. L. Fowler for a term of ten years the right to drill on the latter's land at Livermore for gas, and will carry on extensive operations.

—There is a reduction in the price paid for government surveys from the former maximum rate of $25 per mile for standard lines, $33 for township lines, and $20 for section lines, to $18, $15 and $12 respectively.

—Articles of incorporation of the California Gas Engine Company have heen filed. The directors are: P. M. Hendry, J. G. McElvaney, Chester Varney, John Wilsou and Joseph M. Ongh. Capital stock, $100,000.

—Schaw, Ingram, Batcher & Co., of Sacramento, have issued a handsomely illustrated catalogue. They are making sheet steel and iron pipe, and in the pamphlet give interesting views of their works at Sacramento and elsewhere.

—Articles of incorporation of the Pacific Eleetrical Company have heen filed here. The directors are; W. F. Beckwith, I. E. Rickey, F. H. Kimhall, John T. Hogan, George A. Clough, J. A. McCane and G. W. Rickey. Capital stock $30,000, divided into 6000 shares.

—The San Joaquin Valley Railway Co. is authorized to receive subscriptions to its capital stock. It is proposed to incorporate with a capital stock of $6,000,000, divided into shares of the par value of $100, for the purpose of constructing a continuous competing line of railroad from this city to Bakersfield. The trustees are pledged to maintain and operate the railroad at a competing line strictly, and shal! never have the power to sell out to competitors. No call for money shall he made until $350,000 is subscribed, after which subscriptions shall be payahle in installments of six months or more.

—The San Diego Land and Town Company has sold privately $173,000 of its five per cent honds, the halance of its $200,000 offered to stockholders, according to the circular of 1st June. The Boston directors and stockholders are the purchasers at 92½ net. This will provide for the construction of the Sweetwater system, to cover high lands not yet reached.

—The dividends dishursed last month on local shares of lighting enterprises were as follows: San Francisec Gas Light Company, $35,000; Pacific Gas Improvement Company, $15,000; Central Gas Company, $20,000; Pacific Gas Lighting Company, $6000; Oakland Gas Company, $6000; Edison Light and Power Company, $13,333; California Electric Light Company, $20,000.

—There is between $6,000,000 and $7,000,000 more money in the banks of California now than there was one year ago. The recovery from the panic, so far as the banks are concerned, is complete, and they are conducted on a more conservative hasis than ever. Of 575 hanks that failed during the flurry of '93 but five were in Califoruia, and two of them were sure to fail anyhow.

—The Pelton Water Wheel Co. have recently issued a new eatalogue which is a valuahle contrihution to modern hydraulie literature. It contains a vast amount of information relating to the utilization and development of water powers—of great interest to parties contemplating work of this eharacter. The subject of electrie transmission hy means of water power, now attracting so much attention, is treated in a most exhaustive way, statements heing given of the operation of a large uumher of plants of this character, accompanied by plans, illustrations and much other valuahle data. The Pelton system of power is one of the institutions of the country and is too well known on this coast to need any indorsement. Pelton wheels, almost without exception, are running every mining plant in the country where water is availahle for power. This company have also eonstructed many power plants for eleetrical stations in various localities, some of which have already heen described in these columns.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 18, 1894.

526,303.—CAR COUPLING—W. T. Drew, Sacramento, Cal.

526,348.—EXPLOSIVE ENGINE—H. F. Fraser, Antioeh, Cal.

526,306.—WINDOW-CURTAIN ATTACHMENT—J. M. Freeman, Oakland, Cal.

526,230.—WIRE-FORMING MACHINE—F. H. Howe, Port Townsend, Wash.

526,242.—CONCENTRATOR—L. Look, Soldier, Idaho.

526,249.—PACKAGE—M. J. Meeker, Puyallup, Wash.

526,084.—BUCKET—A. Mitchell, Carbonado, Wash.

526,191.—EXPRESS CAR—Morell & Ferrer, Santa Barbara, Cal.

526,087.—FURNACE—W. Ryan, Globe, A. T.

526,327.—TAP OR FAUCET—M. P. Schetzel, S. F.

526,268.—SASH FASTENER—J. Seadler, Sacramento, Cal.

526,121.—CHECK-BOOK BLOTTER—Toland & Conkey, San Jacinto, Cal.

526,092.—ROPEWAY CLIP—W. R. Wiggins, San Bernardino, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possihle time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BOX-MAKING VISE.—W. O. Knauer, Wood land, and A. V. Tyler, Sacramento, Cal. No. 525,501. Dated Sept. 4, 1894. The machine consists of a novel assemblage of hed and adjnstahle rests, stops and clamps, adapted to hold the loose parts of the hox until they are partially joined, and to receive and accurately adjust the box during the further processes of putting its parts together, and to accommodate different sizes of boxes. A single lever sets up both clamps to hold the two end pieces on edge. The side of the hox is then nailed on, whereupon the clamps are released and the partial hox is reversed and again clamped to receive the other side. The remaining walls are similarly nailed on.

CIRCULATING TUBULAR BOILER.—James A. Bernard, Bakersfield, Cal., assignor to the Locomotive Feed Water Heater Co., Bakersfield, Cal. No. 525,940. Dated Sept. 11, 1894. This invention relates to locomotive tubular boilers, and consists in a means for easing and protecting the superheater which is employed in the boiler from the direct action of the heat of the fire hox. The superheater is placed at an incline within the fire box, and has connected with it a means for supplyiug it with water at one end, a pipe or pipes connecting the opposite end and extending through the front of the furnace, thence returned to the hoiler at a point above the water line, and a protecting arch of fire hrick or clay inclined with relation to the superheater and supported from the sides of the water legs so as to surround the lower surface of the superheater.

TRUSS.—No. 522,764. July 10, 1894. Robert Nagler, San Francisco. This invention relates to an adjustable, automatically acting pressure plate and pad for the support of abdominal hernia. It consists of an elastic plate having an arched concave opening at the lower edge wherehy it is adapted to fit the parts to he treated, aud, in conjunction with this, of au elastie ring having one side fixed at the crown of the arch aud the other crossing the lower part, together with a pad of soft material fitting the pressure plate, and adapted to press against the part to he treated. This device is provided with suitahle pad and thigh straps hy which it is secured in place and the pressure varied and regulated as may be desired. The straps are provided with loose tubular sheathing which allows them any desired movement without chafing the hody. This truss cau be worn as a protector against ruptnre aud will recommend itself to the public on account of the virtues above enumerated.

Octrooi-Aanvrage

Voor Methode om Goud en Zilver van Hunne Oplossingen in Potasch Cyanide Afteseheiden.

Register-Nommer 683.

Ter algemeen narieht wordt hiermede bekend gemaakt dat William David Johnston van beroep scheikundige op den 31sten dag der maand Juli, 1894, en woonachtig te San Francisco, Amerika, te mijnen kantore gedeponeerd eene aanvrage voor een octrooi voor hovengenoemde uitvinding met hijheboorende heschrijving.

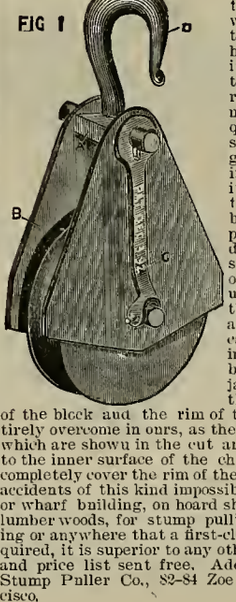
Nademaal nu de gezegde William David Johnston mij schriftelijk heeft kennis gegeven dat hij met deze zijne aanvrage wenscht voort te gaan, heb ik hepaald dat deze aanvrage en alle bezwaren daartegen zullen worden behandeld te mijnen kantore op Vrydag, den 14den dag der maand Decemher, 1894, ten 3 nre 's middags.

Ik roep daarom alle personen op, die er belang bij hebben zich te verzetten tegen het uitreiken van een octrooibrief voor gezegde uitvinding aan gezegden William David Johnston om ten minsten zeven dagen voor genoemden datum van behandeling te mijnen kantore te deponeeren een geschrift, waarin zij hunne bezwaren ontwikkelen, daar zij anders uitgesloten zullen zijn, die voor te brengen.

Aldus den 2 den dag der maand Augustus, 1894, te Pretoria, Zuid Afrikaansebe Republiek.

CARL UECKERMANN, SR.,
PAULNEL, Registrateur van Octrooien.
Gevolmoentigde.
Argus Maatschappij Beperkt.

Improved Steel Snatch Block.



This is admitted hy experts wherever tested to be the hest hlock of the kind in existence for the following reasons: Being made of the hest quality of refined steel it gives greater strength in proportion to its weight, and the opening side being a solid piece does not detract from its strength as in other blocks. In using wire cahle the great damage to which the cable is subject in other blocks by becoming jammed hetween the cheek plate of the block and the rim of the pulley is entirely overcome in ours, as the guiding rihs B which are showu in the cut are snugly fitted to the inner surface of the cheek plates and completely cover the rim of the pulley, making accidents of this kind impossible. For bridge or wharf building, on hoard ship, in mines or lumber woods, for stump pulling, house moving or anywhere that a first-class block is required, it is superior to any other. Catalogues and price list sent free. Address California Stump Puller Co., 82-84 Zoe St., San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12, Oct 17, Nov 7	J E Jacobns, 309 Montgomery
Bay State M & D Co, Cal	22	3c	Aug 25, Sept 29, Oct 24	F E Luty, 330 Pine
Belcher M Co, Nev	49	25c	Sept 14, Oct 18, Nov 8	C L Perkins
Brunswick Con G M Co, Cal	7	2c	Aug 22, Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Bullion M Co, Nevada	43	15c	Aug 7, Sept 13, Oct 4	R R Grayson, 331 Pine
Chollar M Co, Nev	39	20c	Aug 9, Sept 13, Oct 4	C E Elliott, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Sept 15, Oct 16, Nov 5	E B Holmes, 309 Montgomery
Ophir S M Co, Nev	63	25c	Sept 5, Oct 9, Oct 29	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	11	30c	July 31, Sept 11, Oct 2	J W Pew, 310 Pine
Silver King M Co, Ariz	12	30c	Sept 4, Oct 15, Nov 12	J W Pew, 310 Pine
Yellow Jacket S M Co, Nev	57	25c	Aug 2, Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Carson Creek M Co, Nev	A K Durbrow, 309 Montgomery	Oct 15
Cosmopolitan M Co, Nev	B Burris, 240 Montgomery	Oct 8
Presidio M Co, Cal	L Osborn	Oct 2
Sunset G M Co, Cal	T R Dunn, 630 Market	Oct 1
Quiney M & W Co, Cal	W C Ralston, Room 2, 9th floor Mills Building	Oct 9

UNION IRON WORKS,

CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

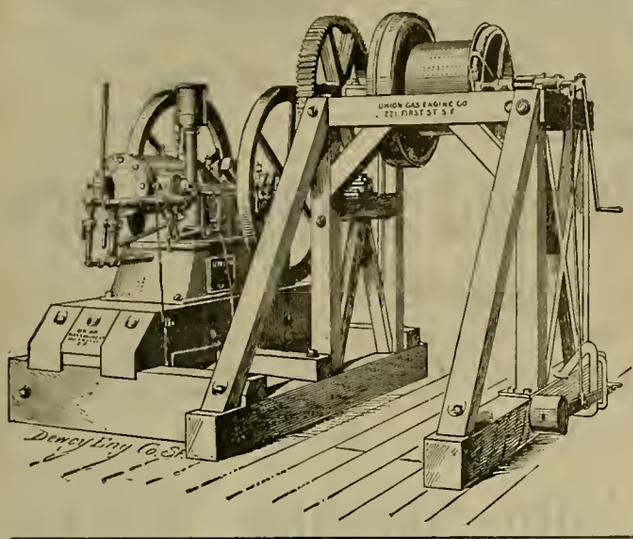
—MANUFACTURERS OF—

MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chill Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

SHIP BUILDERS. ★ BUILDERS OF U. S. WAR SHIPS. ★ HYDRAULIC LIFT DOCK.

NEW YORK OFFICE: 145 BROADWAY. CABLE ADDRESS: "UNION."



Union Gas Engine Co.

Pioneer Manufacturers

Of Gasoline Engines and Owners of Twenty Patents on Same.

ENGINES FOR MINING PURPOSES A SPECIALTY.

WARNING!

If you are in need of power for mining purposes investigate this engine and take no other. Many so-called gasoline engines are now on the market, which are direct infringements of our patents and it is our intention to bring suit against the various infringers. As the law holds the purchaser, as well as the manufacturer, we would advise parties who have already purchased other gasoline engines to obtain from the sellers of such engines a good and sufficient bond protecting themselves in case damages are obtained against them, as it is not the policy of this company to work a hardship on innocent parties, but the law makes no such provision.

Union Gas Engine Co.

SEND FOR CATALOGUE. 221-223 FIRST STREET, SAN FRANCISCO, CAL.

THE PELTON WATER WHEEL!

—EMBRACING IN ITS VARIATIONS OF CONSTRUCTION AND APPLICATION—

THE PELTON SYSTEM OF POWER.

The most simple and efficient water power appliance for mining, electric or other service. Full and reliable information given regarding any proposed application upon receipt of the necessary data

The Pelton Water Wheel Co., 121 Main St., San Francisco, Cal.

THE GATES ORE AND ROCK CRUSHER!

SUPERIOR TO ALL OTHERS FOR EITHER MINING OR ROAD WORK. SEND FOR CIRCULAR.

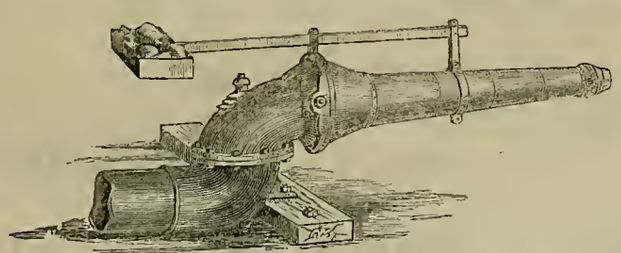
THE PELTON WATER WHEEL CO. . . 121 Main St., San Francisco, Cal. . . General Western Agents.

MINE BELL SIGNALS.

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN LEGAL SIZE, 12 X 36 INCHES, THE MINE BELL SIGNALS AND RULES PROVIDED FOR IN the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We can furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market Street, San Francisco, Cal.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 51 Fremont St., San Francisco.

The Blasdel Concentrating Belt Co.

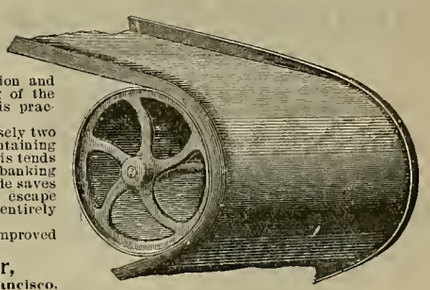
OWING to improved machinery we are now able to sell our NEW IMPROVED CONCENTRATING BELTS for the "Triumph" or Frue Vanners at reduced prices; also our Improved Belts six feet in width.

Practical mill men must see at a glance the advantage of our belts over any other.

First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

We manufacture smooth belts with our Improved Flanges to order. Send for references.



H. G. BLASDEL, JR., Manager,
419 California Street, - - - - San Francisco.

Thomas Price & Son,

Assay Office, Sampling Works

And Chemical Laboratory.

524 Sacramento Street, San Francisco, Cal.

FRANCIS SMITH & CO.,

—MANUFACTURERS OF—

SHEET IRON & STEEL PIPE

FOR TOWN WATER WORKS.

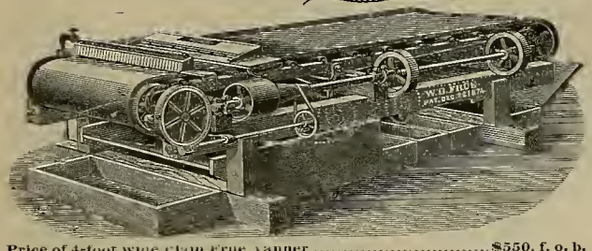
Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.

130 BEALE STREET, SAN FRANCISCO, CAL.

Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.

FRUE ORE CONCENTRATOR.

OVER 4000 IN ACTUAL USE.

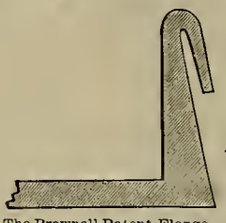


Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.

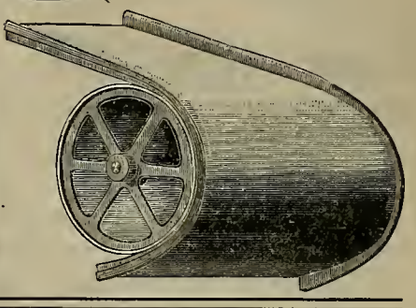
—o—

For any information, pamphlets, circulars or testimonials, call on or address

Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.



The Brownell Patent Flange.



Price of 4-foot wide Plain Frue Vanner		$550, f. o. b.
" " "	Improved Belt Frue Vanner	700, f. o. b.
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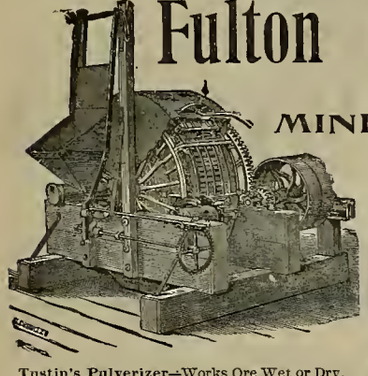

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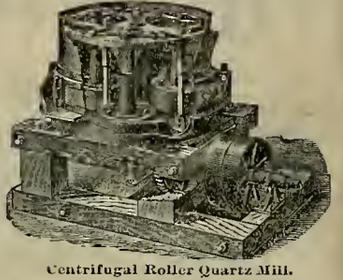

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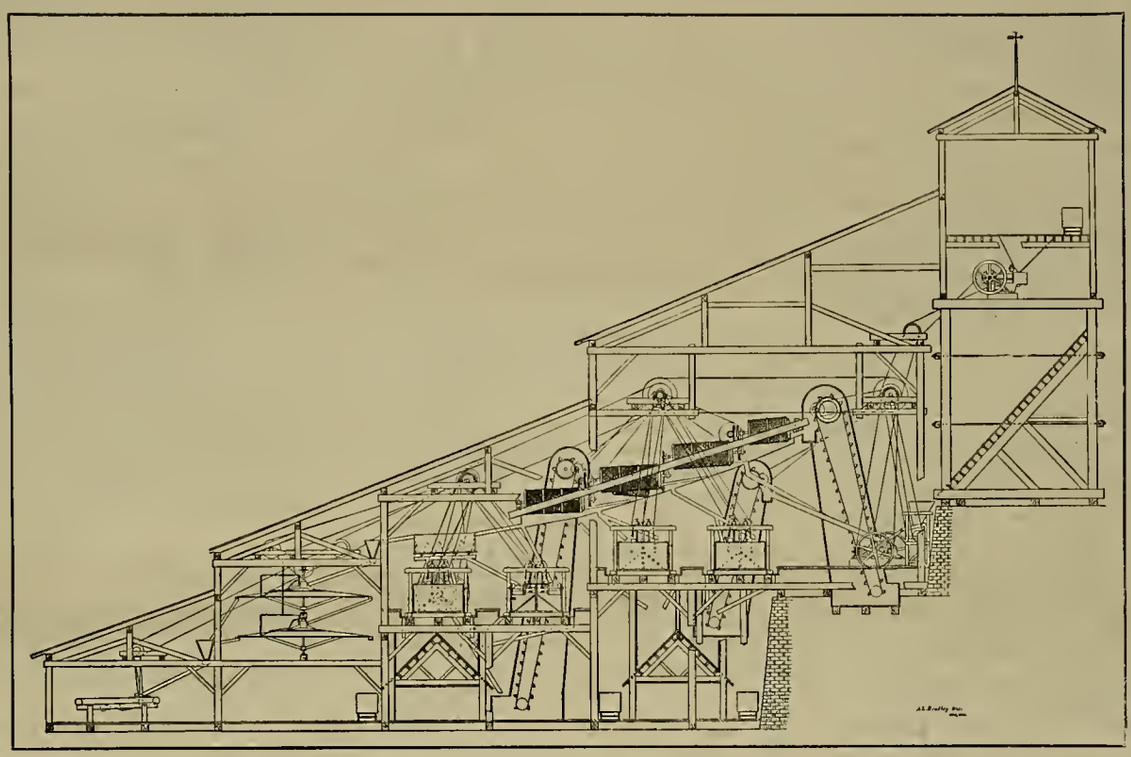
Electricity in Mining.

With increased activity in mining comes augmented interest in electrical power as applied to all manner of mining work. In no department of practical science is electricity more prominent than in mining and metallurgy. At home and abroad the most promising plans of surface work and underground development have electrical power as the principal part of the proposition. The South African mine managers are so imbued with the present progressive spirit in the direction of using electric appliances that it is now proposed to spend £1,000,000 in putting up huge central sources of electrical energy and transmit power to widely separated gold mines, on the same principle that power is transmitted from Niagara to Buffalo. This long-distance transmission of power is claimed to be a feasible idea. It is calculated at the Witwatersrandt that 14,000 H. P. can be developed at an expense of three-quarters of a penny per horse power per hour. The idea has taken such a hold on the Randt mine owners that they have two propositions from European electrical engineers which take the nature of direct bids at precise figures guaranteeing exact results. Indirectly the move exhibits considerable faith on the part of the South African mine owners in the permanence and expansion of their gold fields.



SECTIONAL VIEW OF THE MORNING MINING CO.'S CONCENTRATING PLANT, MULLEN, IDAHO.

CALIFORNIA'S gold product is more than one-third of all the gold coin in existence. Since gold-mining began in this State the yield has been $1,284,000,000. It is calculated that the amount of gold coin now in use aggregates $3,750,000,000.

MORNING MINING CO.'S CONCENTRATING PLANT, MULLEN, IDAHO.—*See page 215.*

MINING AND SCIENTIFIC PRESS.

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San Francisco, October 6, 1894.

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In accordance with law the trustees of the State Mining Bureau have made their report to Gov. Markham. It is a voluminous document and will be priuted in due time. State Mineralogist Crawford also makes a report in extenso. The several assistants also furnish separate reports, the whole forming a compendium of up-to-date information regarding the operation of the bureau and the present status of the mining industry.

The best and most improved mining machinery in South Africa and elsewhere is of American manufacture, and largely the result of California experience, experiment and invention. In that quarter lies large opportunity for development of business. In this regard it is of interest to note that during September one American firm in Chicago shipped 160,000 pounds of mining machinery to South Africa. That is a good country for San Francisco makers of mining machinery to exploit.

That the Australian *Mining Standard* loves its little joke is evinced by the following editorial paragraph in the last issue to hand:

Another marvel from Wonderland! An account of a very strange and wonderful insect, whose doings should prove of interest to students of bi-metallism, comes from Mexico. The minute monster in question is called the "traga oro," and his peculiar property is that he feeds and exists upon gold. It appears that the precious metal, after passing through the abdomeu of the "traga," is transformed into a black powder, from which no chemical agent has as yet been able to precipitate it. Senator Stewart, of the United States Congress, has, we are told, proceeded to Mexico with the express purpose of studying the habits of this luxurious insect, which is said to be self-propagating. Mr. Stewart perceives in this gold-bug a means of getting rid of the other kind of "gold-bugs" that infest the States, and he proposes to utilize its gifts by introduciug it surreptitiously iuto the vaults of the Sub-Treasury of New York, and in other places where gold is stored. "Should the enterprise prove successful," says an American journal, "it is clear that all confidence in gold as a basis of value will be destroyed, and we shall be compelled to fall back on silver as the only available metal for coinage purposes."

One of the most pleasing features connected with the quartz mining industry these days is that so many of the old miues are proving to be valuable ones. Mines that have been allowed to lie idle for from ten to twenty years are again "going conceerns." A ease in point is the old "Quartz Hill" mine, loeated about six miles above Redding, in Shasta county. This mine had been "going begging" for years, and with au idle ten-stamp mill built some years ago within half a mile or less of it. Latterly the mine was experted by M. Maryanski, M. E., and by him was purchased for a company of Chicago capitalists. Reports from there are to the effect that he has a ledge 650 feet long, and from six to ten feet wide, some of the ore running as high as $50 per ton. Such developments tend to give as much confidenee to the mining industry as new discoveries.

A Case in Point.

Attention has been directed to the value and necessity of a change in the mining laws such as is advocated by the Cal. Miners' Association, giviug applicants for pateuts for mining land an equal footing with applicants swearing that the laud they desire to possess is fit only for agricultural purposes. A case iu point is now awaitiug the decision of Hoke Smith, the honorable Secretary of the Interior.

In 1863 some miners located about 100 aeres of land at Sulphur Creek, Colusa Co. This land was mineral land if there ever was such a thing as mineral land. The Manzanita Gold Mining Co. came into possession of it by purchase in course of time. Maehiuery worth $50,000 was put on it, pay ore taken out aud treated at a profit. Two years ago Johu Hays Hammond, now in receipt of a salary of $60,000 a year as mining manager and expert iu South Africa, made a test of about 350 tons of the ore and reported a net profit of $186. He also made a report to Mr. Noble, then Secretary of the Interior, in whieh he stated that the ground iu question was traversed by veins carrying gold and cinnabar Prof. Becker of the U. S. Geological Survey made a similar report.

In '93—thirty years after the location—a man named Tilden Jones "located" this miueral deposit as agrieultural land. Three men—a blacksmith, a butcher and a lumberman—swore to his elaim. The testimouy of John Hays Hammoud, Prof. Beeker and Supt. Northey: the plain facts as stated, were deemed less worthy than the assertion of the three "agricultural" witnesses by the Register of the Land Office at Marysville, before whom the matter was tried, and who allowed Jones to file "a homestead" on it. This decision was confirmed on appeal to the Commissioner of the General Land Office. Now it goes before the Secretary of the Interior for final adjudication.

It is such a flagrant case of injustice to the miners, the owners of the property, that the bare recital of the facts should condemn all connected with the effort to do such injustice. It is hardly within the limits of possibility that a Cabinet officer will give official sanction to such an outrage. It is to prevent the recurrence of such acts that the miners of this State ask that the statutes be so amended that they may have equal footing and a show for justiee under the law.

The Verdict Affirmed.

The United States Circuit Court of Appeals decided last Wednesday on a point of iuterest to miners. It was an appeal from the Alaska Distriet Court in the ease of Patrick Whelan vs. the Alaska-Treadwell Mining Co. While employed in defendant's mine on Douglass Island plaintiff was injured by being drawu through a chute. He was breaking rock at the mouth, and wheu the chute was drawn he went with it. In the court of original jurisdiction defandant moved for a non-suit ou the grouud that Whelan's injuries were not caused by any negligence on the part of the company, but by the negligence of the fireman, who, before drawing the chute, had failed to uotify Whelan, and that the fireman was a co-employe. The lower Court held that the fireman was in fact a representative of the eompany, and negligence on his part should be interpreted as negligence on the part of his employers. The Court awarded plaintiff $2950 and eosts. The U. S. Circuit Court of Appeals last Wednesday confirmed the decision:

"The Supreme Court of the United States," it said, "has repeatedly declared that a master in employing a servant impliedly engages with him that the place in which he is to work and the tools and machinery which are furnished him, or the instrumentalities by whieb he is surrounded, shall be reasonably safe, aud that a failure to discharge this duty exposes the master to liability for injury caused thereby to the servant; that it is wholly immaterial how or by whom the master discharged that duty, and that the master's liability is not made to depend in any manner upon the grade of service of a co-employe, but upon the character of the act itself and a breach of the positive obligations of tbe master.

"It was the master's duty iu the present case to provide a reasouably safe place for its employes to work; to keep the chutes through which the quartz was drawn in reasonably good condition and repair; to employ competent persons in the management thereof, and to notify the workmen engaged in breaking rock in the pit when the rock in the chute would be drawn. Plaintiff, by his contract of service, did not assume the risk that this duty would uot be performed."

In the case of the Mammoth Mining Co. vs. Juab Co., Utah, the Utah Supreme Court has decided that under the statutes providing that "miniug claims" are not taxable, an engine and boiler built iuto a briek foundation, and firmly affixed by bolts leaded down and used in working a mine, are part of a mining claim and not taxable.

Sales of California Gold Mines.

The recent Midwinter Fair did mueh toward advertising and bringing to notiee the mineral resources of the Pacifie coast, particularly that of California, direeting the attention of capitalists to the mineral resources of our State. California gold mines have long been neglected and but little understood, and their values to a great extent ignored by the financial world and only oecasionally heard from as producers, unless it is some phenomenal mine like the Utica and Stickles, the Kennedy, the Rawhide, etc. Since the exhibit referred to California's gold mines have been sought after for investment purposes and rapidly bought up by both Eastern aud continental capitalists.

Mining has too long been looked upon with suspieion as speculative and extra hazardous. But the views of capitalists have changed and this business is now justly viewed as no more hazardous than farming, manufacturing, banking, mercantile or any other industrial pursuit, and the percentage of profits is much greater providing the mine is handled on business principles and with modern appliances. Miniug for gold again ranks as the prominent industry of our State. Placer mining is again forging to the front, the many millions of dollars that have been looked up in the ancient rivers are again beginniug to add to the yearly output. Many hydraulic mines loug lying idle from legal obstructions are being rehabilitated. Of the great number of sales that have been recently made it has been found diffieult in mauy cases to obtain the exaet figures paid, both buyers and vendors being in some cases reticent. There are quite a number of negotiations for mines now pending, but not closed. The following is a list of all that has been made public:

RECENT SALES OF CALIFORNIA GOLD MINES.

Empire, of Gold Valley, Sierra county, on the south fork of the east fork of the Yuba. Purchased by an English syndicate; price paid, $50,000.

Sommerville Con. gold mines, consisting of the Lena, Bellflower, Young America, Seminole, George and Worcester mines of Tuolumne county. W. Babcock, of New York, promoter; D. H. Cole, of New York, the purchaser; price paid, $1,000,000. A plant of the capacity of 100 tons per day is in process of construction. The same company has also purchased the Buckeye mine.

The Lady Washington of Tuolumne county, on the North Fork of the Tuolumne river, adjoining the Dead Horse and the Eureka Con., has been bought by James Rule; price paid unknown.

The Mammoth mine, near Jacksonville, Tuolumne county, bought by Wm. Johns for an English syndicate; price paid unknown—reported $80,000.

A New York syndicate has bought seven mines, situated one mile from the Dead Horse, Tuolumne county, Capt. D. H. Cole purchasing agent; price paid, $1,000,000.

The Victory, situated one mile from Tuttletown, Tuolumne county, sold for $110,000, with a pre-payment of $20,000; balance in installments.

The Golden Rule of Tuolumne county, three-fourths sold to a Montana syndicate; purchase price unknown. The company is now enlarging their mill.

The Black Oak of Tuolumne county, Tom Ewing and associates the purchases; price paid, $108,000—$20,000 down, balance in installments.

Whitlock & Spencer, on Sherlock creek, in Mariposa county; the Sierra Buttes—An English syndicate the purchasers; price paid unkuown. The same system has also bought a group of mines in Calaveras county, price unknown.

New London Group—Situated near Plymouth, Amador county; N. J. Coleman, promoter of sale and superintendent. A mill in process of construction; price paid, unknown.

Oakland, Crown Point & Washington—Situated in the Meadow Lake Mining District, Nevada county; sold to a Salt Lake syndicate, price paid unknown.

Sommerville Group of Mines—Situated ou the ridge, eight miles from Robinson's Ferry, Tuolumne county; sold to a Denver syndicate for $100,000—$15,000 paid down, balance in installments.

The Blythe-Carr Gravel Mines, of Trinity county—Mather and Maitlaud the purchasers; price paid, $25,000.

The French Hill Mines, of Amador county, sold for $140,000; purchasers unknown.

The Boa Gravel Mine, of Yuba county, Timbuctoo district—Recently bought by Joseph D. Redding, the San Francisco attorney; the purchase price unknown.

The Hydraulic Mine, on the Trinity River, above Weaverville, Trinity county, known as the French La Grange purchase, are working a large force of men on new ditch and mine.

Seminole group, situated eight miles southeast from Sonora. Group consists of the Richards, Conley and Grizzly mines. Sold to John Cole et al. for $110,000. Ten stamps in operation and ten more to be added.

Burton group, situated on the Robinson Ferry road, one mile north of Tuttletown, Tuolumne county. Sold to a Montreal syndicate for $140,000. A payment of $15,000 has been made, and the balance in installments. A forty-stamp mill has been ordered for this mine.

The Four Hills mines, situated in Sierra county on the Plumas-Eureka belt, has been bought on Professor Atwood's report. Rosenberg, promoter. Mines sold to the Sierra Buttes Syndicate. Price paid in cash, $100,000.

The Cook mines, Mariposa county, near Coulterville. Sold to Thomas Fox and Thomas Couch of Montana. These mines are to be operated by electric power. The group consists of seventeen pateuted claims. Price paid, $100,000. Working

capital on deposit, $650,000. The principal owners reside in Boston, Mass.

Big Oak Flat Ditch—A company has bought this property, for which they paid $140,000.

The Phœnix, of Sierra county, has been sold to J. A. Fillmore and other officers of the Southern Pacific railroad. Price paid, $40,000.

The Mountain View, of Fresno county, has been sold by A. Wambold to a Chicago syndicate. Price paid, unknown.

Gold Ridge Consolidated, consisting of four quartz mines and 1500 acres of hydraulic ground, has been sold to Lilly Barstow and W. W. Pamfort, of New York. Price paid, unknown.

A group of six mines, lying northeast of the Sierra Buttes, S. P., has been bought by the English Mountain Consolidated Mining Company. Twenty thousand dollars has been paid on the purchase. Price, unknown.

A number of mines in Sierra county have been sold to an English syndicate for $450,000, the purchase price being deposited in and the business transacted through the Manhattan and Chemical Banks of New York.

The Mammoth mine of Grub Gulch, Madera county. One-half of this mine has been sold for $30,000 to parties unknown.

The Manhattan mine, owned by the English Lake Mining Company, has been sold to the Colorado Banking and Mining Association for the sum of $450,000.

The Chuparral Hill mines, near Angels, Calaveras county, have been sold to Mather & Jackson of New York for $500,000.

The Utica and Stickles mines of Calaveras county. It is reported that six and one-quarter millions of dollars have been offered and refused for these mines, the owners stating that they will not name a price for three months yet. These mines are yielding from four hundred to five hundred thousand dollars net per month. It is also reported that one million, two hundred and fifty thousand dollars have been offered for the Rawhide mine in Tuolumne county, and was refused.

Concentrates.

THE Defiance mine at Darwin, Cal., continues to ship ore in paying quantities.

A TRAMWAY is being constructed on the Grady group of mines in the Slocan country.

THE Sinaloa G. & S. M. Co. has incorporated at Los Angeles with an authorized capital stock of $100,000.

ARTHUR TINSLEY & Co. have been offered $50,000 for their Antimonium silver mines near Hunter creek, Or.

THE Samoan Mining Company has been incorporated, with $3000 capital stock, to operate in Mohave county, Arizona.

THE Corydon Gold Mining Company has been incorporated, to operate in Gunnison county, Col., with $400,000 capital stock.

W. F. ENGLEBRIGHT of Nevada City has bonded the Contact mine to S. P. Snider of Minnesota, who has men at work developing it.

IT is said that over $1,000,000 has been taken from the Jicarrilla placers, New Mexico, by panning with water melted from snow.

THE Redondo Mining Co., which recently incorporated with a capital of $500,000, will work three properties near Idaho Springs, Col.

THE Plethora Gold Mining and Milling Company has been incorporated, to operate in El Paso county, Col., with $500,000 capital stock.

THE Bridgeport Mining and Milling Company expect to have their machinery in place on their big mines in Okanogan county, Wash., soon.

THE stamp mill at Wenatchee, Wash., has been purchased by the Wenatchee Mining Company and moved to the mine on Quil Toe Chin creek.

PARK CITY, Utah, reports "a big bonanza" in the Comstock mine—a fifteen-foot vein, sixty-one per cent lead, forty-two ounces silver, and some gold.

THE gold received at the Melbourne Mint for the week ending August 25, 1894, was 24,795 ounces, and the value of gold coin and bullion issued, £123,049.

NEARLY all the Pueblo, Col., base bullion is separated at Argentine, near Kansas City, or near New York, where the gold, silver and lead are sold at market.

THE Wenatchee Mining Company has been incorporated at Wenatchee, Wash. Capital stock, $18,000. Incorporators—M. J. Carkeek, A. McIntosh, Thomas Burke.

THE Scott Mining Co. and the Columbia Mining Co. of Seattle have organized. The capital of the former is given at $100,000 and that of the latter at $1,000,000.

WILLIAM MAGE, of Cleveland, Ohio, and a syndicate of capitalists of that locality, will operate extensively in the rich mica deposits on Bear creek, near Volmer, Idaho.

THE California Debris Commission has issued a permit to Steele & Co. to operate a mine near Brownsville, Yuba county, by the hydraulic process. The permit is conditional.

THE Garner Consolidated Gold Mining Company has incorporated here. Directors—J. Stadtfeld Jr., W. C. Stadtfeld, A. F. Lejeal, Ralph Davis, Charles H. Fish. Capital stock, $120,000.

THE Arizona *Journal-Miner* says two concentrators are being put in at the mill of the Morning Glory Company, and that work in the mine is soon to be under way on a heavier scale than ever.

C. J. MOORE of Cripple Creek, Col., has a theory of the continuity of fissure veins in overlying eruptive rock extending on their strike into the granite, which he proposes to practically test.

THE Spokane and Pend d'Oreille Hydraulic Mining Company has been incorporated at Spokane, with a capital stock of $4000, by E. K. Erwin, F. R. Dow, L. C. Crawford, E. H. Hughes, Ad. Helmers.

THE purchase money for the Boston, Baxter, Sullivan, Columbia, Teller, Davidson, Madeline and Niwal mines, Boulder district, Colorado, is ready. The new company will issue $4,000,000 capital stock.

IT looks now as if the protracted litigation over the Waterloo mine, San Bernardino county, would be compromised, and the case taken out of court. The contest has gone on for many years, and has cost nearly $250,000 in that time. The Wisconsin owners of the Waterloo mine are tired of the litigation, and as soon as the English owners of the Silver King settle the question of debentures the suit will be compromised.

THE Reward Gold Mining Company has incorporated here with a capital of $1,000,000, of which $25,100 has been subscribed. Directors—F. W. Marvin, W. E. Stevens, W. T. Libby, G. C. King and James R. Smith.

THE Bolitho mine, situated one mile south of Angels Camp, owned by William Osborn, has been bonded by a San Francisco syndicate for the sum of $25,000, the company agreeing to sink a shaft on the mine 500 feet deep.

F. CLARNO has brought suit against G. W. Grayson for $75,000 alleged to be due him on the Virtue mine, Baker county, Or. Defendant claims that pluintiff has forfeited all former rights by abandonment and lapse of contract.

A RICH placer strike is reported near Mesquite, on the Southern Pacific railroad, sixty miles west of Yuma. The discoverers are John Peterson, Thomas Kniue and L. C. Moreland. The discovery, it is claimed, is an extremely rich one.

"BAYLEY'S REWARD," the pioneer claim of the Coolgardie, West Australia, gold field, yielded during the twelve months ending April 5th, £234,000 in gold. Since that date the present company has added approximately £60,000 more to the output.

THE Cleveland Mine, near Huckleberry, Lincoln county, Wash., has been bonded for $150,000, the terms of which call for the weekly shipment of six hundred tons of ore per week; values have jumped from hundreds to thousands of dollars in that section.

THE African Gold Recovery Company (Limited) announces that 56,258 ounces of gold have been recovered at the Rand, and 8000 ounces in other districts, a total of 64,258 ounces during August, by means of their cyanide process. The July total was 57,500 ounces.

THE Yuma, Arizona, *Times* says: Gold Rock is going to be better and livelier. A twenty-stamp mill will be put up on the claims adjoiniug the Golden Cross. If this is done sixty stamps will be dropping in the district and the monthly clean-up ought to be $50,000.

THE Morning mine at Mulleu, illustrated on the front page of this issue, will resume in about three weeks. Twelve men were put to work repairing the railroad between the mines and the mill the first of the week. This mine, when running, employs about 200 men.

THE company owniug the Cook property in Mariposa has incorporated under the name of the Merced Gold Mining Company. The owners are in Coulterville and have commenced work on their property. Men are at work near Benton mills for the purpose of taking water for electric power.

THE De Kaap district of the Transvaal produced 51,000 ounces of gold during the half-year to June 30th, the totals for the correspondiug halves of 1893, 1892, 1891, 1890 and 1889 being 31,000 ounces, 32,500 ounces, 28,000 ounces, 11,000 ounces, and 21,000 ounces. The Sheba mine alone returned 39,819 ounces.

THE revision of the mining laws for Mashonaland and Matabeleland has, says the London *Mining Journal*, been completed by the Administrator, Messrs. John Hays Hammond, and Wilson Fox. An Order in Council by the Secretary of State for the Colonies is, however, necessary before the said laws can come into operation.

ARTICLES of incorporation of the Plomoso Cement Mining Company have been filed at Yuma. The company is formed under the laws of Colorado to acquire mineral land and mill sites in Yuma county, Arizona. The capital stock is 300,000 shares having a par value of $1 each. The principal place of business will be at Tyson's Well, Arizona.

THE Boise County Mining Company has resumed work in search of deep placers near Idaho City, this time with a drill, by sinking in the old shaft which was down 115 feet. A total depth of 255 feet has been reached. The theory that that section of the country is underlaid with an auriferous gravel has set everybody there speculating as to the outcome.

ARTICLES of incorporation of the Allison Ranch Consolidated Mining Company have been filed in San Francisco. The directors are: Nat Messer, J. W. Twiggs, T. C. O'Conner, R. H. Follis, G. H. Waggener and James E. Walsh. The capital stock is $10,000,000, of which $9,009,500 has been subscribed by Walsh and the remainder by the other directors.

BY the decision of the United States Court of Private Land Claims all the mineral-bearing portion of the rich Cochiti district is declared to be public domain. The Canada de Cochiti grant, which claim has hung like a pall over that mineral belt since it was discovered last fall, and which claimed to cover 114,000 acres, is confirmed for only 3000 acres, and this is miles away from the mineral belt.

EVERYTHING points to a prosperous fall and winter in Creede, says the *Sentinel*. There are more mines working now than for the last year. Here is the list: New York, Last Chance, Bachelor, Commodore, Happy Thought, Park Regent, Ridge, Ethel, Nelson Tunnel, Schuylkill Tunnel, Alpha and Amethyst. The Presidential group in Phœnix park is being worked and there is talk of the Del Monte soon starting.

A CONTRACT has been made between the Tacoma Smelter Company and the Bunker Hill and Sullivan Mining and Concentrating Company of Wardner, Idaho, by which 800 tons of ore monthly, for six months, will be shipped from Wardner to Tacoma for smelting. The first shipment was made last week. The ore carries sixty-five per cent of lead and thirty ounces of silver to the ton. Part of it will be sent to the Selby smelter in this city.

THE Supreme Court has affirmed the decision in the case of McCormick vs. Baldwin, involving a mining claim on Gold Flat. McCormick attempted to hold mining claims by annually re-locating the same and on the first of January doing a few hours' work. Judge Caldwell instructed the jury that such was a sham and mere pretense, and not sufficient to hold the ground. The jury decided in favor of the defendants, and the Supreme Court has affirmed the verdict.

ARTICLES of incorporation of the Pike Dredging & Amalgamating Company have been filed at Helena, Montana. The incorporators are Charles A. Potter and Colonel O. C. Bosbyshell of Philadelphia, and William E. McConley, E. Abbott Todd and J. S. Sanderson of Springfield, Mass. The company will conduct a general mining and smelting business in Montana, with headquarters at Helena. A branch office will be opened in Philadelphia. The company is capitalized at $1,000,000.

THE theory that free gold quartz does not exist on the western slope of the Cascades has been exploded by the discovery of the Leroy group of claims a short distance southwest of Monte Cristo, says the Snohomish *Eye*. A nugget valued at about seventy-five cents was picked out of a piece of the quartz. The ledge is said to be a mammoth one, and is located at an elevation of over 5000 feet. It has been prospected with several tunnels, in all of which the free gold quartz is shown.

AT Clements, San Joaquin Co., a prospector named Nixon had been mining on land belonging to one Giles. After spending considerable of his own money, and nobody else's, he struck a rich lead and told Giles of his discovery. Giles then warned Nixon off the land. Nixon said that he might as well be without brains as without money, and Giles then turned loose a six-shooter, putting two holes through Nixon's coat. Nixon responded with one shot, when bystanders interfered. Nixon was arrested, thus adding insult to injury.

ADVICES from Chile say that in Coquimbo the gold fever continues developing. Andacallo is not the only place at which gold has been struck, but at Cruz de Caras also, where the range is in a virgin state. In many parts of the province of Anoud gold has also been struck. A man named Arana recently obtained, with fifteen men, in that number of days, $8000 worth of the yellow metal. The gold is said to be very fine, and the indications are that it exists in great quantities. A rush has set in from all parts in consequence.

THE largest and most important mining transaction that has taken place in that vicinity in the past three years has been closed, involving the transfer of five partially developed gold properties in Hell canyon, eighteen miles southeast of Albuquerque, for a consideration of $340,000. The deal was made by H. A. Howard of San Diego for New York parties. Two of the mines are old properties, now free from litigation. The group covers the largest body of free-milling, low-grade gold ore known in that country. Plans are laid for erecting a mill of 100 stamps.

AT Nelson, B. C., last week a verdict was brought in in the case of Hendricks and Hayward against Hennessy Bros. The Hennessys discovered and located the Noble Five group and other prospects in the Slocan mining district, being the original discoverers of that camp. Hendricks and Haywurd claimed that they grub-staked the discoverers and brought suit for a fifth interest. The Hennessys denied the grub-stake. The jury found that William Hennessy was grub-staked, but not John. This gives the plaintiffs a tenth interest in the group, said to be worth from $500,000 to $1,000,000.

THE Copper Queen Company, at Bisbee, Arizona, is reported to be working 400 men, and producing twenty-five tons of copper per day from 250,000 pounds of ore. The company continues to pay dividends regularly. The underground workings are almost interminable. There are over sixty miles of tunnels and thirty-six miles of undergrouud track. The supply of ore is sufficient to last for many years to come. The new converters, which are to extract the sulphur from the copper, are in course of erection. The impure copper will be run from the furnace into the converters, where it will be subjected to an intense heat, and a twelve-inch current of air will be sent through the converter at a velocity that will drive all the sulphur out of the copper.

A BIG mining deal is reported to be nearing consummation. Agents of an English syndicate are now in the Cœur d'Alenes concluding negotiations for the purchase of four of the most valuable properties—the Poorman, Tiger, Gem and Frisco mines. The plan is to operate them under one management, thus not only reducing the expenses of working the properties, but placing the owners in a position to dictate freight rates, smelter charges, etc., to suit themselves. The figures offered can not be learned, but the company is reputed to have £500,000 at its command. Should the sale be effected, a period of unprecedented activity is predicted for the Cœur d'Alenes. It is believed the winter will be spent in developing work and the improvement of the working plant.

IN the Caledonia mine, says the Victor, Col., *News*, the owner of the lease is working all the men he can find room for. He is doing nothing on the shaft, but is confining his efforts to a trench near the surface. Ore is being taken out of the trench, six feet from the surface, running into the hundreds, and the surface of the ore chute, which is 100 feet wide, is yielding $60 to the ton. A few days ago one of the employes of the mine took a couple of handfulls of clay from the walls of the trench and on panning he got $2.50 worth of gold. The men were at once set to work scraping the clay off with their jack-knives, and $150 was secured in that way. There would seem to be some hope of financial salvation in a State in which so profitable mining can be done so simply and so easily.

TWO MILLION OUNCES of gold! This, says the *Standard*, is the wonderful record which the Witwatersrand gold-field is likely to put up before the close of 1894. The figures for the first six months of the year are 973,737 ounces—in itself a truly remarkable achievement. To produce this return, 2200 head of stamps have been hammering away night and day reducing to powder no less than 1,370,240 tons of ore, and the cyanide process has treated 1,212,929 tons of tailings for a yield of between four dwt. and five dwt. of gold to the ton. A noticeable feature of this huge work is the evenness of the yield, the average for the six months having remained at 9.34 dwt. The great ambition of the Rand for a long time was to obtain 150,000 ounces as the month's output. This was realized early in the year. The endeavor now is to make the record 200,000 ounces, and it is quite expected this will be recorded ere another half year has closed.

Personal.

WM. PRESTON, director of the U. S. Mint, is at Denver, and may come this far.

G. W. GRAYSON has returned from a visit to his property, the Virtue mine, Baker City, Or.

Methods of Mine Timbering.

NUMBER V.—CONCLUDED.

The sketch of the Caledouia miue, iu the Black Hills, S. D., represeuts the mine as it appeared in the spring of 1883. The main shaft was sunk in the large veiu, the hoisting works being located on the adit level, 200 feet from the surface, vertical measurement, and 820 feet from the mouth of the tunnel. This shaft reached the footwall on the 300-foot level, and a large stope was at ouce opened around the shaft, a pillar of ore thirty feet sqnare being left to support it. The shaft was continued vertically to the 400-foot level and an extensive stope opeued there also. The gold-bearing rock of the Caledonia is hard white quartz, whicb occurs in bunches and reticulated veins in chloritic schist, and in this respect resembles some California mines, as tbe Utica-Stickles, Gover, and some others. In the Caledonia great headers were excavated in advance of placing the square sets. Tbe timbers were all properly framed and were massive, but there was a disregard of what were considered the minor unecessary details in placing them, particularly on the walls and against the roof. As these large stopes were extended, too broad an area was takeu out at one time, aud the superincumbent weight at length threw the timbers out of line, and almost witbout waruiug the mine caved, the immense timbers "jack-knifing" aud snapping like reeds. Thousands of tons of ore, the expensive machinery, and a mass of splintered timbers were dumped in a chaotic mass to the bottom of the 400-foot level. There were three causes which led up to this disaster: The extractiou at one time of too large an area of grouud; carelessness iu timbering, and the slippery nature of the footwall (talc scbist), which afforded a poor support to the large pillar of ore.

It is unreasonable to expect a frame of timbers, however strong, to support the weight of a mountain of rock, and for that reason discretion should be used in extracting large bodies of ore. It is hazardous to attempt to remove a section more than three or four sets wide at one time from the floor of one level to that next above. A breast may extend entirely across the deposit or vein, but if more thau four sets in width are removed at one time it allows too much weight to fall upou the timbers, and the probability of a cave is greatly increased.

By taking out a section, which may extend eutirely across the vein or deposit, three or four sets wide, and carrying the stope up somewhat in the form of a pyramid, so that on nearing the floor next above only the space of a single set or, at most, not more than two, be at first removed, and the timbers firmly wedged to the sills before enlarging the excavatiou at that point, all the ore may be extracted, and the operation in this manner is atteuded by the least expense and danger. When a section has been mined out from level to level as described, a secoud section may be attempted. Under all ordinary circumstances it will be found that the timbers will usually support the ground until the stopes can be filled with waste. At many mines waste is obtained on the surface, and in some the opening of large chambers in the hanging wall is necessary to obtaiu a sufficient amount of material for filliug the stopes. There is always danger in the removal of a mass of rock which stands ou a base that is broader than its upper portion, or apex, like the letter "A," while on the other hand a "V"-shaped mass is largely supported by the walls. Many ore bodies are lens-shaped; that is, broader at the center than those portious either above or below, and iu these masses the greatest expeuse and dauger atteud the removal of the upper portion.

In building square sets, the sills, sixteen to twenty feet in length, are first laid down on the floor at right angles to the walls. These timbers are the largest in use in the mine, and should properly be as long as they can be handled. At regular intervals shallow depressions are cut across the upper face of the timber one inch in depth and superficially the same size as the posts which are to rest upou the sill. In the center is cut a mortise, two-thirds the square of the post, at least 6x6, and larger as the size of the timber is increased. Into the mortise a tenon on the bottom of the post fits nicely. The sills are laid horizontally and exactly parallel, at such distances as may have beeu determined upon, usually five or six feet from the center to center of the posts. The sets may be placed in the form of squares or rectaugles. Two sills having been laid, four posts, constituting the four coruers of a set, may be placed iu position. They may be of greater length than the posts of sets above, the object being to afford more room overhead on the sill floor, if desirable. A temporary platform is constructed by spiking stout planks to the two sets of posts at right angles to the sills and placiug on them planks or lagging. This staging is built at a suitable height, to enable the men standing thereon to lift the heavy caps and place the ends upon the posts. The caps are placed directly above the sills; that is, iu a direction extending from wall to wall.

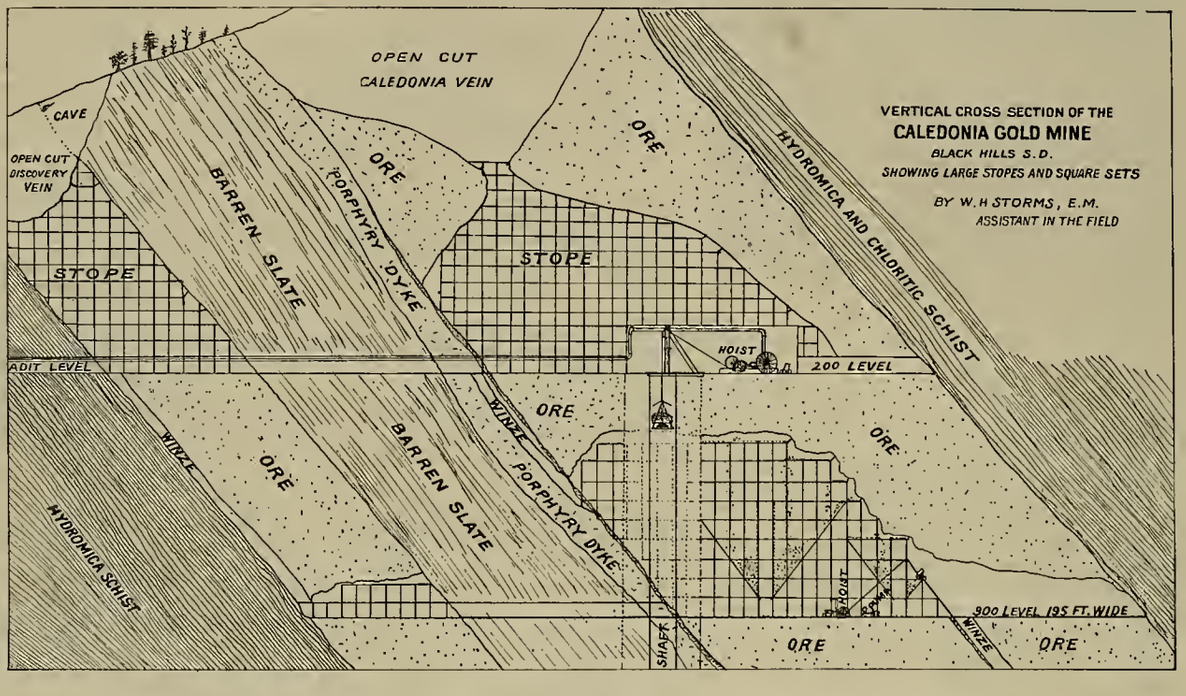
Each post is framed with a tenon both top and bottom; that at the upper end being two-thirds or three-fourths, and that at the bottom, one-third or one-fourth the thickness of the eap. It is necessary that tbe bottom of eacb post sball rest directly upon tbe top of tbat in the set next below. All the timbers must be carefully framed or it will be found that they will uot join properly.

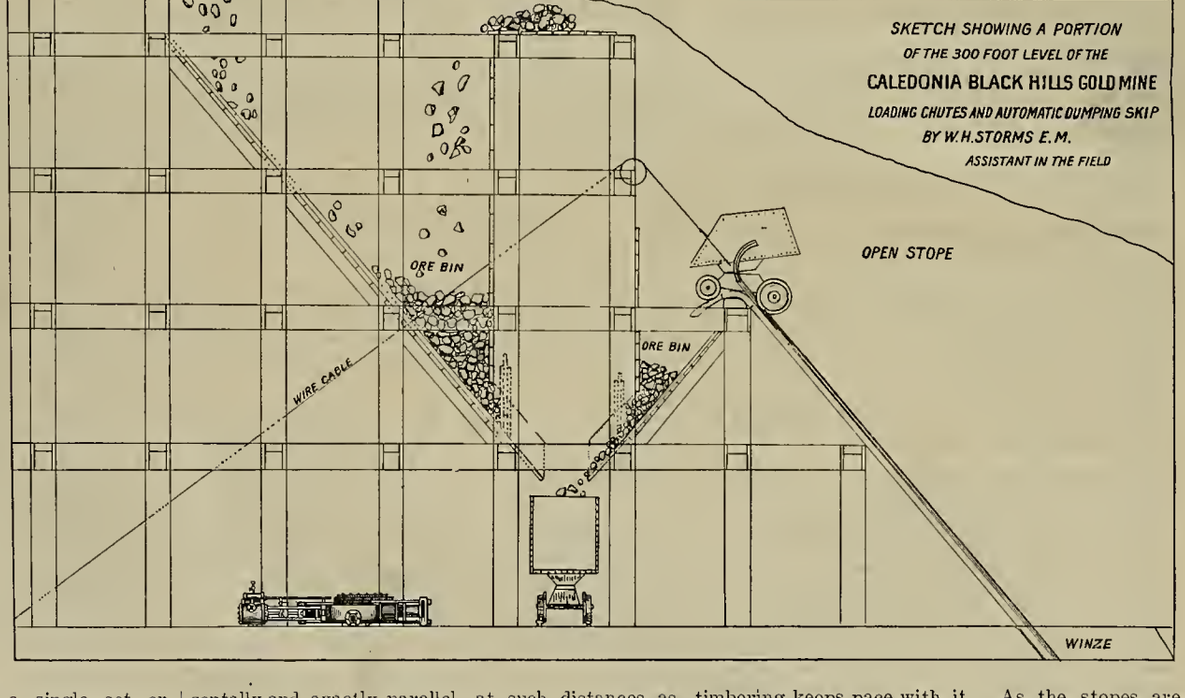
Having placed caps upon the posts, the ties may also be lifted into position, crossing from post to post and resting upon them in the same manner as the caps, but at right angles to them. The broad side is laid upward, the width of which is equal to that of the post, which is square. The tie is equal to the smaller widtb of the cap. Tbe ties should fit tightly, aud if they do not, must be secured by wedging at the ends. The best results are obtained when it is necessary to drive the ties down with mauls.

As the work of extracting the ore proceeds the timbering keeps pace with it. As the stopes are carried upward, set is built upon set, reaching from one level to another. Temporary working floors are laid, split laggiug beiug used for this purpose. These floors are moved from time to time as the work progresses. Ore broken down on these floors is shoveled into the bins beneath, or onto the sill floor before the bins have been provided, and from there shoveled or dumped into cars and sent to the surface.

When timbers have beeu placed the wedges along the walls should be driven up between the plates and walls, and in all other places where needed, to secure firmness aud rigidity, and some one man should be detailed to look after them and see that they remain so; for in large stopes the ground is constautly shifting more or less, and the weight being transferred from one point to another causes the wedges to loosen, when they must be again tightened to insure safety.

The size of timbers used in tbe square-set system ranges from 8x8 or 8x10 inches to 24x28 inches, though timbers of the latter dimensions are often





difficult to obtain. When such massive timbers cannot be had, the sets may be constructed on a smaller scale, having a lesser distance between posts, and also less height to the set; thus greater strength is secured by the employment of a larger number of timbers.

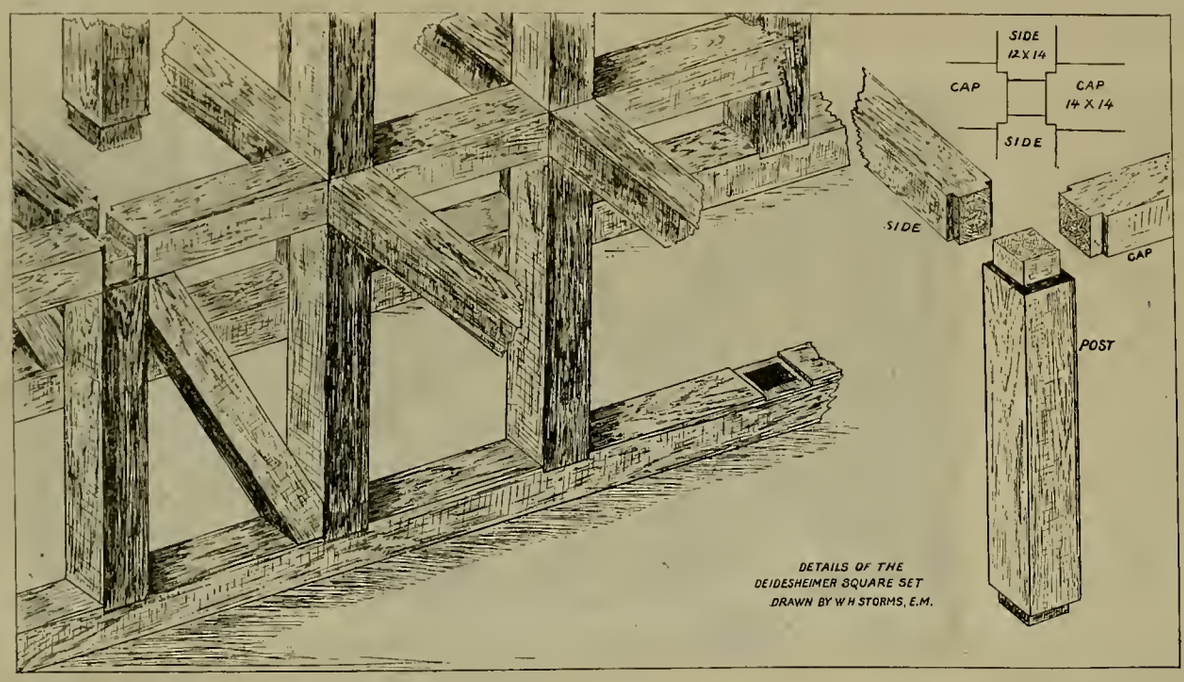
Caps encroach upon the posts two to six inches according to their dimensions, while ties have a rest of one to four inches, this being also determined by the size of the timbers. The posts are framed in accordance with the dimensions determined upon, which must be constant, to secure uniformity, whether the post be 16x16 or 24x24. As all caps are of the same length and all ties of an equal length, it is evident that if the tenons on the posts vary with any difference in the size of the posts (should any difference occur), the system would soon be out of line. As the timbers used are all sawed, it should not be difficult to secure them, having a uniform size for any single stope. In any event, the tenons at the top and bottom of the post must have a uniform size regardless of the dimensions of the post. For instance, should eighteen-inch posts be in use on any particular level framed with twelve-inch tenons, if from necessity or choice a twenty-inch or twenty-four-inch post be introduced in the sets, it must have a twelve-inch tenon, corresponding with the others. Square timbers are usually framed with gang saws, and are therefore uniform, and any particular stick, whether post, cap, or tie, may be used in any portion of the mine.

Posts and caps which come in contact with the wall plate are mostly framed by hand, to order, careful measurement having first been made to determine the exact dimensions. Caps which meet the plate within less than two-thirds the width of the set are frequently made continuous from the second post. Wall plates are cut in sections, the length of which is determined by the conditions in the mine. These are also mostly framed by hand. The manner of framing and fitting these timbers will be understood by reference to the drawings.

Cap sills are often used in preference to wall plates on the footwall of a vein. They are applicable to small stopes as well as great chambers. As the name implies, these timbers are simply an extension of the cap from the post nearest the footwall to the wall where it rests upon a hitch cut in the wall (two feet or more, according to the character of the ground.) It then forms a sill for the post of the set next above, as illustrated in the accompanying drawing.

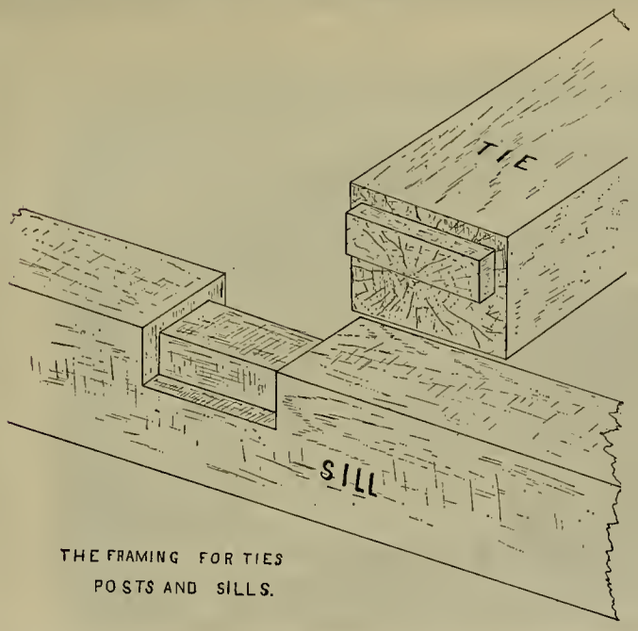
The method commonly in use for cutting a seat for a post in the sill: that of cutting a section an inch deep entirely across the face of the sill, in the center of which is a mortise to admit the tenon of the post, has been superseded in some mines by a new practice, which has many advantages, particularly the ease with which all rock and other foreign substance may be removed when ready to set the post. The tie or girt is let in on each side, they being cut out to the depth of one inch at the ends. The drawing will explain the idea better than a description. The posts have a tenon one inch only in depth. A longer tenon would afford no additional security or firmness.

A great deal of good ore is sometimes lost by the settling of large veins upon the timbers of the first few floors of a stope so heavily as to throw the timbers out of line, when bulkheading and filling in must at once be resorted to to prevent caving. In the Anaconda mine of Butte City, Montana, a case of this kind occurred. The timbers on the sill floor were forced out of line, and it was evident that a disastrous cave was imminent. The stope was packed full of timber and waste as rapidly as possible and the level abandoned. A drift was then run from a crosscut in the footwall, sixty feet from the vein, and in this lateral drift at distances of sixty feet, and directly opposite the chutes in the abandoned stope, as established by the mine surveyor, a square set was placed. A raise was then carried up on an incline to the vein, where it was still intact above the filled stope from each of these points. These raises were timbered with square sets, which in section would present the appearance of a series of steps. The rock in which the drift was run was solid granite; but, as the footwall was approached, it was much decomposed and required substantial timbering. Had the footwall country rock been firm and hard, no timber would have been necessary, except at the stand on the floor of the drift where the loading chute was constructed and at the junction of the winze and footwall of the vein. Through the winzes thus made, the lost ore was almost entirely recovered.

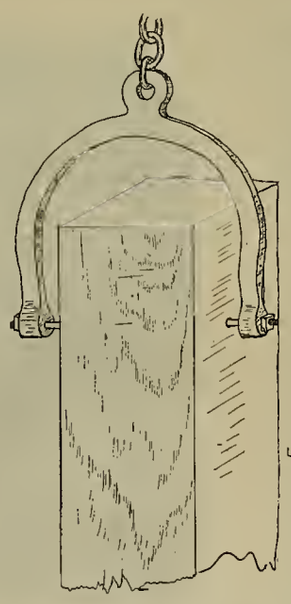


Diagonal braces are necessary in heavy ground. It must be borne in mind that they, in a measure, perform the office of stulls, and should not be placed at right angles to the hanging-wall, but at a higher angle. For instance, supposing the inclination of the hanging-wall to be forty-five degrees, the diagonal braces should stand at fifty-five degrees. The height and width of the sets must be determined by the desired inclination to be given the diagonal or angle braces, and before this can be determined the inclination of the hanging-wall must be known. The angle braces may be of the same size as the posts, or a little smaller. These timbers are not mortised nor framed with tenons, but are slipped in sideways and secured by thin wedges if they are not tight when put in place.

When the pressure is greater, apparently, from the side than from overhead, the method of framing and joining these timbers is somewhat different. The cap becomes the post. The tenons at each end of the cap in this case are exactly the same size, while the tie is also provided with a tenon, but of different style from that used where the timbers are framed to resist top pressure. The placing of wall plates and angle braces is the same in each system.



THE FRAMING FOR TIES POSTS AND SILLS.



DEVICE FOR LOWERING TIMBER UNDER THE CAGE OR SKIP.

It frequently occurs that bulkheads of solid timber, or cribs filled with rock, have to be built to sustain sinking roofs which have already been substantially timbered. Bulkheads are formed by laying massive squared timbers side by side, filling the space between sets. Upon these are laid a second layer at right angles to the first, and so on from floor to roof of the stope. Cribs are constructed by building up timbers in the form of a hollow square or rectangle, the interior space being filled with large broken rock, and also extends from floor to roof. Either of these devices forms a very substantial support to settling ground, though sometimes inefficient.

Bulkheads of solid masonry are sometimes built in mine workings to stop a heavy influx of water. They should be constructed with the greatest care and in the most substantial manner possible to prevent future collapse. When it becomes necessary to build a bulkhead of this kind a section should be cut in the floor, sides and roof of the drift, and the masonry extended into these spaces. Water bulkheads are sometimes built of dry timbers, which, swelling, effectually shut off the influx of water.

An instance recently came to the knowledge of the writer in which a large flow of water followed the cutting of a subterranean reservoir by a power drill. As usual in such cases, wooden plugs were inserted and driven in, but to no purpose, the force of the water driving them out. The protection of a bulkhead seemed necessary to prevent the flooding of the mine. An experiment was first tried, which, proving successful, rendered the bulkhead unnecessary. A section of pipe provided with a globe valve was inserted in the hole, the valve remaining open until the pipe was firmly secured by wooden braces and tightly wedged in the rock. The valve was then closed and the flow shut off. Provision then being

made to haudle the water, the valve was opened partly and the reservoir drained. It seems that this plan might be adopted with advantage where the influx of water interferes with the construction and completion of a water-tight bulkhead, for at times the flow of water is so great that it is almost impossible to construct a bulkhead, owing to the pressure of the water back of it.

The largest known body of ore in California to-day is in the Utica-Stickles mine, Angels Camp, Calaveras county. Its exteut is, as yet, unknown. The workiugs have thus far exposed a mass of gold-bearing rock rauging from forty to more than 100 feet broad, over 400 feet high, and exceeding 1000 feet in length. Stopes of this size require a very substantial system of timbering, and the square-set system, which has been described at length, is exactly suited to its reqnirements. It is not in use, however, but in its stead another system, which is quite similar and based on exactly the same priuciples, still having very important differences.

The timber used in this mine is exclusively round, peeled pine logs, which are delivered by contract at the surface works. The cost of these logs, I am informed, is ten cents for each inch of diameter, making a sixteen-foot eighteen-inch log cost $1.80, and a twenty-four inch log $2.40. These timbers are all cnt into two lengths of eight feet each. They are mostly over eighteen inches in diameter, and occasionally are found as large as twenty-eight and thirty inches in diameter. The posts are framed to fourteen inches, top aud bottom, the tenon being four inches high. Caps are framed to fourteen iuches at either end, the tenon beiug six inches long. Thus it will be seen when two adjacent caps are placed on a post the tenous will not meet, but will have a two-inch space between them. This space is filled by driving in a section of two-inch plank fourteen inches square. At the junction of caps and posts are two ties in place of one, as in the square-set system. These ties rauge from a foot to sixteen inches in diameter and are about four feet in length. The lower one has a horn four inches in length on its upper half. These projections rest upon the shoulders of the posts. The upper tie is tightly wedged between the posts. This system has replaced that formerly in use at the Utica miue, in which the posts were sixteeu feet high, caps being let into the sides at eight feet and others resting on the top. The new system is much preferred and has many advantages over the old (a thirty-inch post sixteen fect in length weighed over 3300 pounds). In the present system the posts aud caps weigh from 700 to over 1000 pounds each.

Owing to the impossibility of procuring round timbers that are exactly uniform in size, the Utica system involves a vast amount of dressing timbers underground to secure the necessary uniformity in joining. While the system is one affording great strength when properly placed, it would seem to possess uo advantages over the square-set system, and to be more troublesome, cumbersome, and, in the writer's opinion, more expensive thau the latter, though the first eost of round timber is less than that of sawed square timber.

No wall plates, excepting short siugle pieces, are employed, and no sills are laid upou the levels of the floors. It would appear that neglect to provide sills will in time prove a great disadvantage in connecting the stopes from level to level.

The mauner of handliug timbers at mines depends to a great extent on the size and number of timbers used, and ou the character of the shaft, whether it be vertical or inclined. In drift mines and mineral deposits which lie nearly horizontal they are set in on flat cars (trolleys) built for the purpose. When cages are used in vertical shafts the timbers are set upright on the floor of the cage, lashed together, and lowered into the mine. At inclines it is a common practice to load the timbers into the skip and lower them down the shaft in that way to the desired point.

At the Utica mine the heavy timbers are haudled quickly and easily on the surface. They are sent from the framing machine to the shafts ou trolleys. Two men are kept busy a great deal of the time in sending timbers undergrouud. A number of stout chains eight feet iu length are provided. In the center of each chain is a four-iuch ring, and at each eud a dog, having a point projectiug at about seveuty degrees four inches in length. One of these dogs is driveu iuto the side of a post or cap somewhat above the center. The chain is passed over the eud of the timber and the other dog is driven into the opposite side. A spike six or eight inches long, having a five-foot piece of rope attached, is driveu well into the lower skips of the timber, and it is ready to lower into the miue. Beneath the skips are stout chains with rings. An extra chain having hooks at the ends is at hand. This forms the conuecting link between the chain beneath the skip aud that attached to the timber. Having been securely hooked the skip is raised slowly, lifting the timber from the platform. The rope and spike at the bottom are used to bring the timber to a standstill before the skip is lowered. Having reached the level where it is wanted the rope again comes into use in landing the timber at the station.

The Utica shaft is almost vertical. This process, while a conveuient aud quick way of handling these heavy timbers, cannot well be used in shafts departing very far from the perpendicular, unless a slide of plauk be laid between the guides or runway of the skip, and it would then be advisable to line the slides with strips of flat iron. It would appear that timbers might be handled in this mauner in shafts having as low au inclination as thirty-five degrees, particularly if the slide be lubricated. It is certainly a superior method to that of loading the timbers into skips, which involves much difficulty, particularly in lauding them at stations. Most mines have blocks and tackle at the stations, secured to heavy timbers overhead, for unloadiug timbers from skips.

It is always a good plau, where possible, to have complete connection from level to level by means of winzes in veins requiring very large timbers. The timbers may then be unloaded on the level above where they are to be used and lowered through the winze nearest the stope where they are to be placed, and to the particular floor of the stope where they are required. Winzes for this purpose should have, if possible, au inclination of sixty-five degrees. Where the slope is too low for them to run, however, the timbers may be dragged down, which is certainly much cheaper and easier thau hauling them up.

All timbers should be framed on the surface where possible, as it saves much time and trouble. Gang saws are much to be preferred to auy other method of framiug timbers for square sets. The timbers can, iu this way, be framed as exactly, if not more so, than by haud, aud in one-tenth of the tiue.

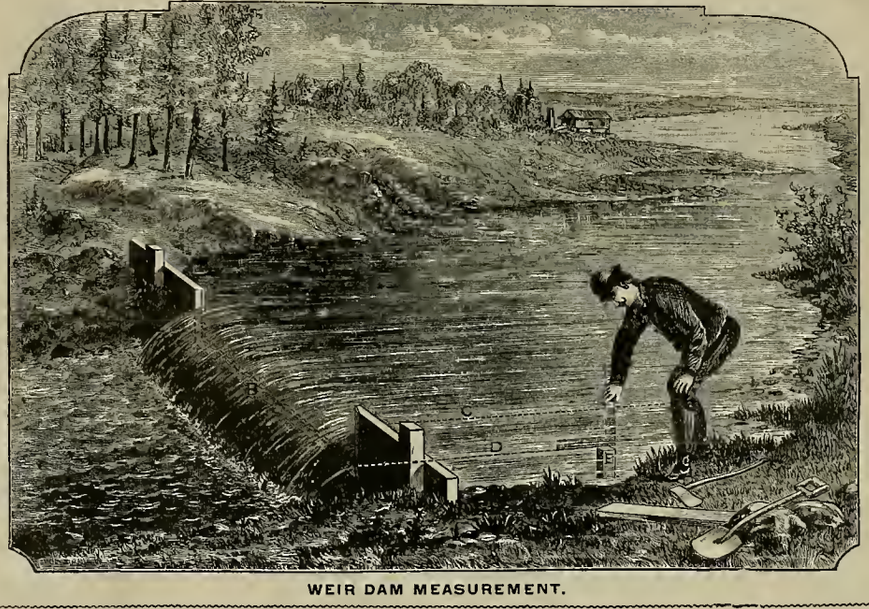
In mines where cages are used, when it is necessary to send long timbers down iuto the mine, as sills for square sets, or long plates, much time is saved by boring an auger hole through the timber near the end and passing an iron bar (⅞-inch) throngh it. The ends of the bar are provided with threads and nuts. These ends pass through the ends of a U-shaped frame, forming a large clevis. The clevis is attached by a chain to the bottom of the cage, and in this manner lowered to the point desired. The principle is the same as that employed at the Utica mine. The drawing herewith will convey an idea of the device above described.

Measurement by Miners' Inch.

"A miner's inch" is not a fixed quantity, the term being iudefinite, its exact applicatiou being of local determination. It is primarily a pressure measure, and it is on that questiou of pressure hinges the difference in the several modes of measuring by what is usually called "a miner's inch." All are agreed that is the amount of water that will pass in twenty-four hours through an opeuing one iuch square, the difference in custom being the amount of pressure or the depth of the center of the openiug below the water line. If four inches, the delivery is calculated to be 538½ gallons per hour; if six inches, abont 600 gallons per hour. While, of course, the greater the pressure the greater the flow, the matter is neccssarily largely one of theory, deducted from the flow occasioned by the laws of gravity, aud influenced by the manner of delivery, the nature of the edges of the hole, the head of water above the hole, etc., so that exactness caunot be reached. Then, again, there are ten, eleven and twelve-hour inches, and a twenty-four-hour inch.

A Smartsville, Cal., iuch is calculated on the discharge of water through a four-inch hole with a seven-inch board top, thus passing through 1.78 cubic feet per minute. The La Grange Ditch Co., Miltou Ditch Co., and North Bloomfield B. G. M. Co.

MINER'S INCH MEASUREMENT.



WEIR DAM MEASUREMENT.

measured an opening 2x1½ inches, six-inch pressure, giving 1.575 cubic feet per minute. Other companies in California measured in different ways, the theoretical number of cubic feet discharging varying from 1.78 per minute in the case of the Smartsville inch to 1.40 in Amador county.

It was long since deemed of sufficient importance to be legally defined, and the State sets "a miner's inch" at that quantity of water which will flow through an opening of one square inch in the bottom or side of a vessel, under a pressure of four inches above an opening. According to this, fifty of the above miners' inches are equivalent to a discharge of one cubic foot of water per second.

To get the number of gallons in miners' inches, multiply the given number of inches by 14.961, pointing off five decimals. The result will be the number of gallons discharged per second.

To get the miners' inch in gallons, divide the number of gallons flow, or discharge per minute, by 8.9766. The result will be the number of inches sought.

One miners' inch in gallons per second is..	0.1496
Per minute	8.976
Per hour	538.56
Per day	12,925.44
Per month	293,418
Per year	4,721,017

It is believed, however, that for all practical purposes it may be assumed that a miner's inch will discharge in one minute 1.57 cubic feet.

The accompanying illustration is of an opening, fifty inches long and two inches wide, in a two-inch board; the opening being from its center to the surface of the water seven inches, or from the top of the opening to the surface, six inches. The opening represents 100 miners' inches, which will discharge 157 cubic feet per minute, ascertained upon reliable and practical experiments by competent engineers. When the opening is narrower or wider, the discharge will differ slightly from that stated; being more with larger and longer openings, and less with smaller and shorter ones, but sufficiently close in estimating for any size of stream adapted to this method.

The illustration shows an aperture fifty inches long, two inches wide, through a two-inch board, the outside lower edge of the board being chamfered an inch. The slot is shown one-half drawn open; but the board or gate, which slides by means of a rabbit or a shoulder upon the top board, carries a piece fastened to its end, which slides back and forth in the slot, making the spill of water more or less in width, to suit the size of stream, or to keep the depth of water over this notch, exactly six inches from the surface to the upper edge of the notch. A colored line may be painted on the up-stream side of the board, giving the exact height above the notch, or the board itself may be so located that the width of it above the notch is exactly six inches. The moment the water begins to spill over the board the gate can be further drawn and the opening increased, until precisely the quantity issues through the opening that will hold the water at the top level of the dam or board, or at the line drawn upon it, to represent the distance above the slot or mortise in the board.

When the gate has been sufficiently drawn, or properly adjusted by means of its handle, so that the upper level of the water will stand exactly at the line, the length of the opening through which the water is passing can be easily measured. This length, multiplied by the two inches opening, gives the exact number of miners' inches. As an instance, if the gate is sufficiently drawn to make the opening thirty inches long, through which the water is spilling, there will be sixty miners' inches. As the notch is two inches wide, multiplying the thirty inches by two obtains the sixty square inches, or sixty miners' inches. Assuming that each miners' inch will discharge 1.57 cubic feet, there will pass sixty times that quantity, or nearly ninety-five and two-tenths cubic feet per minute.

For irrigation purposes water is sold in this State by the cubic foot a second, or the miners' inch, or the thousand gallons, the latter being deceptive and unsatisfactory. With the irrigator, the standard measure of water is the cubic foot a second, or "second foot," as it is often called. In a ditch a foot wide and a foot deep, in which the average velocity (not the top or center velocity) was one foot a second, it would give a cubic foot a second. If the velocity were two feet a second it would give two feet a second, and so on.

On account of the difficulty of getting the average velocity, water in considerable quantities has to be measured with a weir or the fall over a sharp-edged board from a still pond. But this is inconvenient for small quantities, and it is not always convenient to make a pond large enough to deaden the velocity of the stream to a stillness reliable for accurate measurement. It was because of this that the miners in early days adopted the pressure measure—the miners' inch.

A discount of about thirty-six per cent is made for the twisting of the water and other resistance to its discharge, which leaves a flow of 13,000 gallons a day, nine gallons a minute or 540 gallons an hour. These are in round numbers, which will be used all through for convenience. They vary a trifle not worth considering and only make them harder to remember.

This is a convenient measure because it is one-fiftieth of a cubic foot a second. It amounts to 620,000 cubic feet a year, which equals 4,750,000 gallons. This will cover an acre over fourteen feet deep in a year, and cover ten acres about eighteen inches deep. This would give to ten acres six irrigations of three inches each, which would be more effective than six rains of three inches each, as they generally come.

One miner's inch will flood

10.00 acres per year	1.45 ft. deep
14.49 " " "	1.00 ft. deep
18.11 " " "	9.00 in. deep

In the measurement of water in a stream the weir dam method, herewith illustrated, is deemed of value.

It is first necessary to know the amount of head and fall that can be secured. The next step is to ascertain the quantity of water the stream affords. The quantity of water can be closely estimated by the following suggestions and the illustration. Use a board long enough to reach across the stream, with each end set in the bank. Cut a notch in the board, deep enough to pass all the water and long enough to reach about two-thirds across the stream. The bottom ends of the notch *B* in the board should be beveled on the down stream side, leaving the upper edge almost sharp. The stake *E* should be driven in the bottom of the stream several feet above the board on a level with the notch *B*, this level being easily found when the water is beginning to spill over the board.

After the water has come to a stand and reached its greatest depth, a careful measurement can be made of the depth of water over the top of stake *E*. Such measurement gives the true depth of water passing over the notch, because if measured directly on the notch the curvature of water would reduce the depth. The line *D* is a level from the bottom of notch *B* to the top of stake *E*, while the dotted line *C* represents the top of the water, and the distance between the lines gives the true depth or spill over the weir board. The line *D* has the appearance of running over the top of the board, when, in fact, it passes behind it—the reader is supposed to look through the board and the post. The surface of water after passing below the board should not be nearer the notch *B* than ten inches. Neither should the nature of the channel above the board be such as to force or hurry the water to the board, but should be amply wide and deep to allow the water to approach the notch quietly. If it passes the channel rapidly it will be forced over the notch and a larger quantity will pass than is desired.

Suppose the notch in the board is twenty inches wide, and the water at the stake *E* five and a half inches deep. Then 5.18 cubic feet is the quantity of water passing for each inch in width; since the supposed weir is twenty inches, this result must be multiplied by twenty, which gives 103.6 cubic feet per minute.

An important matter in measuring small streams is the possibility of damming or holding the water, and using it a part of the time instead of constantly. If the water is held for twelve hours, and the whole quantity used in the next twelve hours, with the supply that the stream affords in the same time, the power of the stream would be doubled, for the twelve hours, and give a better effect than if used constantly.

Arsenic Mining.

There are many points of interest in the way in which arsenic is obtained from one of the most famous mines in England, the Devon Great Consols. The mine was originally worked for copper alone, and would have been abandoned but for the discovery that the waste thrown out as worthless when copper was sought, proved rich in arsenic. Although copper is still raised, it is in small quantities, and the mine has been resolved into an arsenic works. The arsenic pyrites consist of 25 to 30 per cent. of iron, 12½ to 14 per cent of arsenic, and the rest of earthy matter.

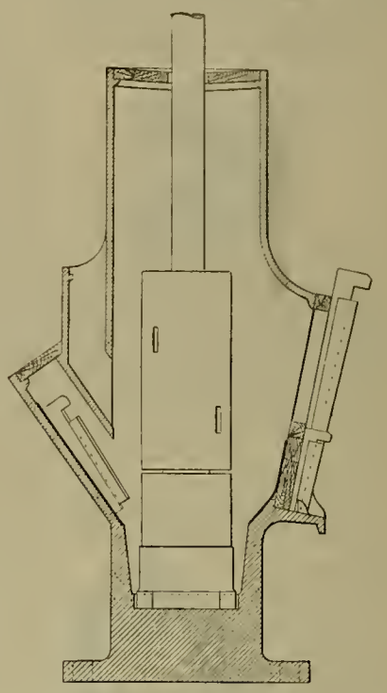
After being crushed this is sorted by girls from 13 to 16 years of age. It is then washed and "jigged" or sifted, and then passed on to the first calciner, where it is burned with low-class coal, and produces "arsenic soot"—that is, arsenic so mixed with smoke from the coal as to be of a gray color.

The arsenic and soot, deposited in combination in the chimney or coudenser, are scraped out and taken to the second calciner for purification. The calciners consist of revolving iron drums, through which a fire of anthracite coal is carried on rotating iron furnaces kept red hot. As the arsenical soot is subjected to the influence of this heat the arsenic is sublimed and condensed. The operation has to be carefully watched, and if the workmen burn the arsenic badly they have to pay for it.

The arsenic is liable to produce sores if permitted to lodge in wrinkles and folds of the flesh, or about the mouth or nostrils. As a rule, however, this only happens when there is carelessness as to personal cleanliness, and the arsenic workers simply have to wash themselves throughly every day on returning from work. Otherwise the work is considered healthy.

A New Gold Mortar.

The accompanying cut represents a combination mortar, manufactured by the Edward P. Allis Co., Milwaukee, Wis., designed for wet crushing, either with or without amalgamation. This style of mortar is desirable especially in custom mills where ores are worked either by amalgamation or concentration, or



both. When used for gold amalgamation, it is fitted with front and back coppers. The front opening or discharge of the mortar is fitted with a chuck-block below the screen frame, to which the front copper is attached. As the dies wear down, this chuck-block is replaced by a narrower one to keep the height of the die and the level of discharge relatively the same, which is an important feature in the amalgamation of gold in a mortar. The back copper is accessible from the back of the mortar, through the covered opening as shown, and is secured in place by a dovetailed key at each end, thus permitting it to be adjusted to the varying height of the dies and relatively to the discharge. When the mortar is used for wet crushing, to be followed by concentration without amalgamation, the chuck-block and coppers are omitted. The outward inclination of the screen increases its capacity and prevents the openings in the screen from becoming clogged by wood fiber, of which there is more or less in nearly all ores. The cuts on the front page of this issue are self-explanatory. The plant illustrated was built by the Edward P. Allis Co.

Miners vs. Agricultural Claims.

TO THE EDITOR:—On a recent trip to the mountains I visited several mining properties, some of which were in litigation with "agriculturists," and one of which belonged to the latter. Never before have I been so impressed with the unscrupulousness of a certain class of men, who seem ready to put their consciences into their pockets and swear to anything as now. In one instance a valuable mining property was being and had been worked to a profitable outcome, and yet it was claimed as agricultural land by another.

Between the railroad and the agriculturist the miner has had a very unjust deal, and it is about time the miners of every county combined to protect their interests, by forming a special fund for sending to San Quentin every perjurer who treads upon their rights. A few men put behind the bars would end this outrage on the miner.

As the California Miners' Association is to hold its yearly convention on the 19th of next month, I suggest that miners, who have a just case of perjury, present all the facts of their cases to the convention, and thus bring forth some more decided attention for the protection of miners than has been had of later years. Of course, we all know this kind of work has been going on for years, more or less, and been "winked at." And now that mining has more value to it than the agricultural idea has, the "agriculturalist" is turning his lands into profitable mining ventures.

It is a possible thing for any miner who can find a good unlocated claim on "agricultural" land, even though patented, to locate and hold it, from the simple fact that the "mineral" is unpatentable, except as such, and that perjury conveys no rights. Mining is now coming to the front, and the prospector will have more protection in the future than in the past.

ALMARIN B. PAUL.

San Francisco, Oct. 3, 1894.

Scientific Progress.

LAST WEEK reference was made to Prof. Dewar's successful experiments in producing intense cold. It was then stated that he had not yet succeeded in liquefying hydrogen, but expected to. Since then experiments lead to the helief that he has converted hydrogen gas, the lightest substance known, into a liquid, and produced a temperature of 240° below zero, Centigrade.

The theoretical hasis of all these experiments is the fact that a volatile suhstance, when evaporating, will produce on the surface of the vessel containing it a temperature which is lower than that of the surrounding air. This effect may he heightened if the fluid first be put uuder enormous pressure hy mechanical means, and also hy having the evaporation occur in a receiver from which as much air as possible has been exhausted. Thus, with liquid nitrous oxide, liherated under those conditions hetween the outer and inner walls of a douhle receptacle, Dewar got —90 C., and reduced to that temperature a more volatile fluid, ethylene, contained in the iuner chamher. The ethylene had also heen put under pressure before heing set free, and gave —145 on evaporation. Compressed oxygen, hrought to that temperature hy the ethylene, produced —210 when liherated.

There, for a time, Dewar thought he was effectually halked. It is not necessary, in order to change a substance from the gaseous to the liquid state, to reduce its temperature to what is known as its hoiling point. If it he suhjected to great pressure, it will liquefy at a higher degree. It must, however, he reduced helow what is called its "critical point." Thus, liquid oxygen boils at —184 C. But its "critical point" is —115 C. Natterer suhjected this gas to a pressure of thirty tons to the square inch; but as he used a temperature ahove —115, his efforts failed. Dewar, on the other hand, not only employed enormous pressure, hut cooled his oxygen helow its critical point. Hence he was able to convert it into a liquid at —145. Now the critical point of hydrogen is —210. The utmost skill of the great experimenter would enahle him harely to reach that stage, hut not go a single degree further. His victory was finally achieved hy making a new substance, a mixture of air and hydrogen, whose critical point was about —200. The old tactics thus became practicahle. His product was sometimes a sort of paste or jelly, and sometimes a white solid with a clear liquid so volatile that he could not capture it. Both theoretical reasons and thermo-electric apparatus enable him to say that it had a temperature of ahout 240° helow zero C. He does not feel disposed positively to pronounce the liquid to he hydrogen, pure aud simple; but he is unahle to say what else it is, and evidently believes it to he that gas iu a new form.

The difficulty which he has in collecting the fluid, owing to its volatility, is not his only embarrassment just at present. These experiments are very costly, and it is intimated that he needs pecuniary help in prosecuting them further. Of the liquid air which he is able to produce, two-thirds evaporates in the handling. But of the liquid hydrogen he gets only from one to five per cent. In other words, it is ahout twenty times as expensive.

This matter hecomes intensely interesting when one remembers that the "ahsolute zero" of the scientists, the degree of cold heyond which it is estimated it is not possihle to go, is only —274 C. (—461 Fahr.). Dewar has almost reached that point already. It is natural to believe that if any one ever gets there within a few years he (or perhaps Pictet of Geneva) is the man to do it. Moreover, if either of these chemists or any one else ever succeeds in completely isolating liquefied hydrogen from other substances, and in keeping it at a temperature of —230 or —240 for a short time, it ought to he possible, by using it in the same manner as nitrous oxide, ethylene, oxygen and hydrogen have been used, to produce still more extreme cold. Hydrogen is the lightest and most volatile substance known. Hence it is the very last resource left, apparently. In his other attempts Dewar has gone down fifty or sixty degrees at a time. Where will the final one land him?

The Big Telescopes.

The glasses of Mount Hamilton, Milan and Pultowa reveal worlds at the present time in all stages of evolution. They may he traced from misty nehulæ to glitteriug suns, from orhs in the high noon of development to those that repose in the sepulchral shadows of the coming night. But, says the Pittsburg *Dispatch*, neither hy analysis or analogy can we conclude that the activity of the universe hegan only when man hegan to evolve on the inconsequent and dimiuutive sphere kuown as the earth. We may not conclude that the myriads of scintillant suns in space—the 500,000,000 of orhs that the great Lick telescope disclosed in the milky way alone—are only celestial lanterns hung out to illuminate terrestrial night. A wider knowledge sustains the conclusion that other worlds long preceded ours and shall long continue when the fretted fahric that we call our glohe shall have passed away. We may, then, dismiss some of our early conceptions and grasp the fact that terrestrial creation, instead of ranking as the event in the economy of the universe was only one in an eternal train of minor incidents. What else may he the meaning of that illimitahle and infiuite field of space where glows diffusiug light and heat, the countless hosts of colossal suns, which, we are compelled to acknowledge, must radiate their light and heat, and must diffuse these into systems that must evoke them.

And wheu the great Chicago telescope is completed, when we may explore the added area and possess the added iutensity and the stellar revelations come nearer to us, and when, heyond that telescopic achievemeut, come others in the coming century with still farther and keener sight, we may he ahle to grasp hut a littlc of the great significance that may he unfolded.

The world is yet young in stellar science. It is not old in any kind of science. It is ouly in the dawn of the significance of knowledge and of making its practical application. We are hefore the sunrise; only in the twilight, and just hehind us is the night. We are still so near our congeneric savagery that the harharous imprint confronts us everywhere; the civilizing telescope, even with ourselves, is almost as nothing to the interest hestowed on some new death-dealing device, and our greatest honors we hestow on those who are most conspicuous in the destruction of their fellows.

AN ENGINEERING JOURNAL, in discussing various popular misconceptions of scientific phenomena, refers to the frequency with which it is stated that large amouuts of valuahle fuel are poured into the air in the form of smoke from the chimneys of factories and the funnels of steamers. Such statements are now declared to he almost entirely without foundation, and it is held that no appreciable economy is likely to he effected hy smoke-consuming devices and that mauufacturers should demand hefore adopting them much more convincing and sounder reasons than those usually given. The analyses of a series of furnace gases made by a committee of the English Institute of Mechanical Engineers showed ahsolutely no carhonic oxide in any one of the eighteen samples taken from each funnel. The city analyst of Glasgow, Scotland, maintains as the result of analysis that in all ordinary coal the heating power of the whole of the hydrocarbons is only a small proportion of the total, and hence, even if the whole of these escaped combustion entirely, the loss would not he so serious as it is commonly stated to he. Even soot contains only about sixty per cent of combustihle material, and samples collected from heavy smoke showed only 51.46 grains of soot per 100 cubic feet of furnace gases. The soot consisted largely of mineral or incombustible matter. Careful experiments show that the solid comhustible matter of the smoke can only account for the very small percentage of 0.71 of the total heating power which can he ohtained from the coal. The conclusion reached is that the real waste in smoke is very small indeed, and the popular helief in immense loss from this cause is simply a fallacy and is decidedly not corrohorated hy experiment.

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Mechanical Progress.

Chimney Draft.

It is generally supposed that the draft of chimneys is due solely, or almost so, to the expanding of the enclosed heated air in the chimney, thereby giving it a buoyant or ascensional power, which is known as draft. But unfortuuately for this theory we find a decided draft in chimneys without heat or fire passing through them.

The fact is as to drafts, like electricity, we know very little as to cause and effect, independent of the fact that all the technical journals are profuse in formulæ to show the amount of work produced by electricity and draft respectively. Should one ask an engineer versed in electricity or draft from the mechanical standpoint, what produces the phenomena, if he is candid he will frankly admit he does not know.

A gentleman of high standing in electrical engineering, when I asked him to define electricity, replied that he did not know, but it was produced in one way by revolving at a high velocity a coil of wire in space, and combing, as it were, the electricity from the surrounding atmosphere. Rather a romantic answer, but one which, in a way, defines the operation.

As to draft in chimneys, although applied in the arts for over 1800 years, yet no one can say with certainty how it is produced.

If any one will look over the transactions of the mechanical engineering societies and read the discussions on chimney draft they will be surprised at the differences of opinion expressed by the learned men who have discussed the subject. But there is one fact as to which there can be no doubt, namely, to produce a good draft in any chimney the height of the chimney is an essential factor for the economic combustion of fuel.

The draft power of chimneys is dependent on their area of cross-section and height, other things being equal. The ordinary tables and formulæ for dimensions of chimneys for various horse powers of boilers is based on the following assumed or asserted data:

First—The draft power varies as the square root of the height.

Second—The power varies directly as the area of the shaft.

Boiler makers as a rule assume the above to be correct. Now as to the facts in practice: The draft power based on the above, and the tables deduced therefrom, a chimney 48 inches in diameter and 150 feet high, would be only sufficient for 425-horse power boilers, whereas the writer has actually produced 1000-horse power (based on 30 pounds of water evaporation) by a chimney of the above dimeusious, and purposes to add a 200-horse power boiler as soon as may be required.

I cite the above to show the fallacy of all the formulæ as to draft power of chimneys. It is assumed, according to the above rule, that their height should be eight times the area of the chimney. The quality or kind of fuel is not stated.

The important factor, grate surface, depends on the different kinds of fuel used, and the conditions under which the fuel is burned; again, the tables are also based on a temperature in the chimney of 600 degrees. A very high temperature, it would seem, having in view proper economy. The intensity or degree of heat evolved by the fuel varies in proportion to the rate at which it burns; the greater the draft is, the greater the amount of work will be produced from the same fuel. The power of draft is directly proportional to the height of the chimney, and the velocity with which the external air flows in to supply the draft depends upon the temperature of the asceuding gases. The higher the temperature is, the lighter will be the gases, which consequently will produce a stronger draft.

That there is draft in a chimney without fire no one will deny. In a great many chimueys the infiltratiou of air through the masoury has, no doubt, a great influence to retard the velocity of the heated gases when in use. The intensity of draft is independent of the area, and depends upon the differeuce between the inside aud outside temperature. The degrees of heat produced by the fuel varies in proportion to the rate at which it burns; the greater the draft is, the greater amount of work that will be produced from the same fuel. This goes to show the importance of tall chimneys; therefore the power of draft is directly proportional to the height of the chimney, and the velocity with which the external air flows in to supply the draft depends upon the temperature of the ascending gases.

Air at 520 degrees temperature expands to double its volume at 32 degrees; therefore, the higher the temperature is the lighter will be the gases, which, consequently, will create a stronger draft.

A rapid draft is, in one respect, equivalent to a large fire-grate area, since it enables more fuel to be burned in a given time, and thus increases the power of the boiler in generating steam. A rapid draft, however, has this advantage, that, inasmuch as the temperature of the furnace is higher when the same quautity of heat is generated in a small space than it will be when generated in a large space, the heat is trausmitted much more rapidly to the water in the boiler in the case of the strong draft, by reason of the higher temperature thus obtained. The maufacturing requirements of modern times demand the building of high chimneys, so as to enable more fuel to be burned in a given space of time, and thus increase the power of the boiler.—W. Barnet Le Van.

Pipe Bending.

Small iron pipes, up to one inch in diameter, may be bent cold and even coiled by wiuding them around a mandrel in a lathe, provided the diameter of the coil is at least nine or ten times the diameter of the pipe to be bent. Short bends in iron, brass and lead pipe are apt to flatten at the bend. This is frequently prevented by filling the pipe with lead, which must be melted out after the bending has been completed.

A set of "bending coils" can be easily made by any machinist for use when occasion demands. A separate coil is ueeded for each size of pipe to be operated upon. Steel wire is wound into a coil which will slide easily inside of the pipe to be bent. One end of the coil should be tapered to allow it to enter the pipe easily. The other end ought to be fitted with an eye turned in the end of the wire. Into this eye a cord or chain must be fasteued so the coil may be pulled out of the pipe after bending.

The pulling out of the coil does not require as much power, after the bending, as would be supposed, because the pulling of the coil lengthwise causes a decrease in diameter of the coil, which permits it to be drawn easily out of the bent pipe. Wire one-eighth of an inch in diameter should be used for a bending coil for a pipe one inch in diameter; for one and one-half inch pipes, one-quarter inch should be used.

A COLLIERY SHAFT was sunk recently at the House colliery in Belgium in an interesting manner by the Pœtsch process, which has been employed once or twice in this country for similar work. A number of metal pipes were first sunk outside the limits of the proposed shaft to a depth lower than a stratum of water-bearing sand nearly 40 feet thick, which occurred at a depth of about 200 feet. These tubes were quite large and closed at the ends, and inside them were placed others open at the ends, so that the interior of each main tube was divided into two chambers. A very cold solutiou of chloride of magnesium was then forced down the smaller tubes, and rising outside them in the larger ones it gradually froze the water in the quicksand until it became hard enough to be worked like rock, so that a shaft could be sunk through it. The water flowing through the quicksand when work began amounted to over 4000 gallons an hour, and to freeze it required eighteen of the double sets of tubes, which were sunk on the circumference of a circle about eighteen feet in diameter.

IT HAVING BEEN FOUND that water meters, like gas meters, sometimes register more than the actual consumption, investigations were made at Mannheim, Germany, which showed that an air sack in the house pipes would produce this effect. It is therefore recommended that apparatus, consisting of an air chamber and clock valve, be placed just inside the meter to take up vibrations due to bad plumbing.

MR. MAXIM'S FLYING MACHINE, which was injured by an accident last July, has been repaired. He now offers to build a machine for crossing the English channel within a year if $250,000 is furnished him for that purpose. This would be the culminating test should it succeed, and a leading British periodical—*Industries and Iron*—thinks that the money would be well spent.

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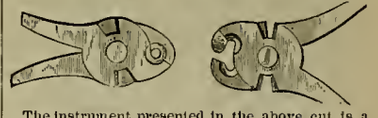
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MINING ITEMS—AMADOR GOLD MINE.—*Republican:* The argument in the case of Vincent Neale vs. the Amador gold mine was heard before Judge Davis in San Francisco on September 5th. The case was argued in San Francisco for the convenience of the lawyers. Vincent Neale argued for the plaintiff and Mr. Eikoff for the defendant. The matter is now submitted to the court for its decision. The point in contention is the right of possession of the Amador gold mine. The suit does not involve the title beyond the mere right of possession. Plaintiff claims possessiou by virtue of a sheriff's deed under foreclosure sale. While holding tbis deed the defendant corporation, by its agent, took forcible possession and has held possession ever since. Plaiutiff therefore sues to gain possession under the forcible entry and detainer provisions of the code. We are informed that in the event of the plaiutiff gaining possession, the Euglish company will at once proceed to operate the Amador Queen property, which has been consolidated with tbe Amador gold mine under the English incorporation. There are two suits pending in the United States courts regarding the title to the Amador gold mine, but as far as the Amador Queen is concerned, we believe the title to that property is not in litigation.

LUCILLE.—The mill ou this mine, formerly known as the New London, is being pushed ahead rapidly. Mr. White of San Francisco has charge of its construction. He is the same party that built the mill of the Amador gold mine. The contract calls for a forty-stamp mill. Much of the frame work of the old mill erected for Ballard and Martin will be used. A small force of carpenters is at work at present. A representative of the Joshua Hendy Machine Company is on the ground in the interest of his firm, that company having the contract for furnishing the iron work for the mill. The water for power will be taken from the Hayward ditch.

MISCELLANEOUS.—The Gover mine is still in the hands of the sheriff. The prospect of its startiug up under the arrangement recently made between the company and its creditors is not bright. Robert Doble, the secretary, was in Jackson the past week to effect some change in the agreement so as to secure any money that may be advanced to put the mine iu working order, by a first mortgage upon the property. This the attaching creditors do not seem willing to do, and so the matter stands at present. The supply of fuel at the mine is not more than sufficient to run another week, and when that is exhausted somebody must furnish wood to keep the engine going, otherwise the long-deferred calamity—the flooding of the mine—will overtake the property.

The sheriff's force employed to keep the mine free of water was withdrawn lately, and the court allowed tbe wages of keepers, engineers, etc., and authorized the sheriff to pay the same out of the money in his hands, realized from the cleanups of the mill. The water is being kept out at present hy the Keystone Company, who undertake for a few days to keep the mine from filliug up.

Mariposa.

AN AWAKENING.—*Express:* The English syndicates who are operating in the Mariposa mining fields understand the full value of electric power. They are takiug a lively interest in the proposed Yosemite Valley railroad for two reasons, the most weighty of which is the prospective decreased cost in milling their ore. The item of transportation is not to be sneezed at, and, being men of ideas and experience, they are not slow to appreciate that fact. Several of the syndicate are now negotiating with the projectors of the proposed railway, and with the completion of the latter project, the mining regions of Mariposa, already feeling the effect of recent developments, will become one of the most celebrated coin producing sections in the United States. The good results flowing into Merced as the logical outcome are incalculable. The population of both counties would double in a couple of years with the possession of such advantages.

Nevada.

Transcript: A quartz ledge of good size and remarkable richness was struck a few days ago in the West Harmony drift gravel mine. Free gold can be plainly seen iu much of the quartz, and some of the pieces are literally filled with the precious metal. There are two good ledges in this mine, but as the company are operating for gravel the quartz will not be worked until some time in the future.

Cor. *Herald:* Reports from all the working mines in the vicinity are very favorable, and the outlook for the coming spring is unusually hright for both Washingtou and Eureka towuships. Messrs. Hippert and Foley are putting up a mill on their ledge near Graniteville. The Rainbow mine now has a force of abont twenty-five or thirty men at work. The California has let a contract for 1,500 feet of tunnel and has a number of men taking out ore. The Mountaiu View mine, on Canyon creek, has been increasing its force of employes. The Culbertson mine, in Eureka district, still continues to do well. Iu the spring a large mill will be erected at the Spanish mine below where the present mill stands. This miue is well opened and developed so that it can now be run at a great reductiou iu expense, eveu below the remarkhly low cost on which it has been conducted heretofore. We hear that the Oak Tree mine will have a working force of about fifty men during the coming winter. The Blue Jay continues to look as favorable as ever. Mr. C. G. Fisk & Son, who have returned to the town for the winter, report very encouraging prospects at their gravel mine on Fall creek, and Mr. James Blaine, who has charge of the mine adjoining Messrs. Fisk & Son's, reports likewise. The last named property is owned by Messrs. B Murphy, Jr., & Co. The Fall creek country is a section of our county that has been greatly neglected by mining men, though it has in the past yielded an immense amount of gold to local prospectors.

Riverside.

Gazette: William R. Hearst, of the San Francisco *Examiner*, and J. M. Wilson, a San Francisco capitalist, have taken a working bond of ninety days, with a generous forfeit, upon the Arica group of gold mines in Riverside county, California, located thirty-five miles west of Ehrenburg on the Colorado.

The owners of the claims are Hiller & Gray, Phœnix, J. E. Teeters of this city being also interested with Mr. Gray in one of the claims. The purchace priee, which is to be paid if the mines are accepted, is $175,000, of which $125,000 is to go to Hiller & Gray and $50,000 to Gray & Teeters.

The capitalist investors have placed a large force of miners at work and by the expiration of the bonding time will have thoroughly tested the properties.

Gold is the metal that is to be found in the Arica claims, and there is said to be a fabulous amount of it in the ore so far developed. Something like 500 feet of development work has been done, and throughout free gold ore has been exposed in a broad and well defined lode. Experts who have examiued the property declare it one of the greatest mines in the West, and though the price to be paid is a big one, the general impression heretofore has been that an even million would be none too much.

Col. Gray is exceptionally fortunate in securing good mines. He was one of the first owners of the famous Harqua Hala mines and was a party to the sale to Hubbard & Bowers for about $50,000, a sum ridiculously smaller than the value of the properties, which afterward were sold for three-quarters of a million. It is believed that the Arica claims are fully as good as the Harqua Halas, with even a stronger ore body, and before long its output may be depressing the market price of gold bullion.

Sierra.

RICH DEVELOPMENT.—*National-Bulletin:* The Bull of the Woods is situated near Haskel's Peak, iu Sierra county, and about three and a half miles southeast of Gold Lake, at an altitude of about 7900 feet. Major Mason, J. C. Knickrem, N. Frayer and two other gentlemen each own a one-fourth interest in the property. Recently a shaft was put down forty feet beside the vein and a cross-cut into ore made. The ledge is estimated to be thirty feet wide. Previously Major Mason had ruu a tunnel 136 feet lower than the shaft to tap the lode. This was driven in 600 feet and to within 115 feet of the shaft. The body of ore is said to be immense and is considered to be on the "mother lode" of that country, of which the Young American mine forms a part. About two feet of the vein next to the hangiug wall is a very peculiar ore, embracing galena and copper-silver glance. The owners think it fabulously rich and confideutly assert that it will produce from $50 to $60 per ton.

On Monday, Messrs. Frayer and Knickrem purchased the Huntington mill at the Bushman mine near Quincy and are moviug to the "Bull of the Woods." They will push work on it, and they expect to have it in operatiou in about three weeks. The property is only a few miles south of Mobawk Valley and a short distance across the liue, in Sierra county.

Trinity.

TRINITY CENTER MINES.—*Journal:* J. C. Strode is running his mill steadily on his quartz ledges on Hostetter gulch and is makiug large cleanups monthly. This is probably the most valuable quartz mine in the county that is now being worked. He is working ten men at the mine. In the spriug he will put up reduction works and otber improvements and will have a finely equipped plant.

At the Altoona quicksilver mine in the Cinnabar district, work is progressing rapidly and satisfactorily. All the machinery is on the ground and the furnaces are about half finished. All improvements put up by tbe company are of substantial nature, and are so located that the free working of the mine can never be interfered with. At present all the help that can be used to advantage is being worked. About fifty men are employed in the mine and forty men in the woods getting out timber, etc. One thousand cords of wood have been stored for use and a contract for 300,000 feet of lumber has been filled for the company. The plant will be ready for operation in abont six weeks. In this miue tbere are three paying ore bodies, two of which were found this summer in doing development work. The ore is of very high grade and yields a large per eent of quicksilver. All work done on the Altoona mines this summer has been under the efficient direction and management of Superintendent J. F. Cox. This property is undoubtedly the most valuable of any quicksilver property in the State, and as soon as operations are conducted on a large scale will make a name for itself not confined to Trinity county.

One of the most promising strikes made in the northern part of the county, or in any part of the county this summer, was made last month on Cedar Creek mountain, at the head of Cedar creek, distant from Trinity Center about nine miles. The discovery was made by G. Doty, a prospector in partnership with William Vollmers, and consists of two locations, to which the name of Mountain King has been giveu. The name is an apt one. The ledge has beeu uncovered by three crosscuts 200 feet apart, and shows up an average width of twenty-five feet. Throughout its entire width the ledge prospects in free gold, in some places assaying as high as $40 to the ton. The average grade of the rock is from $8 to $10 to the ton. The owners are running trails and have put up a cabin on the property. A tunnel has also been started to run on the ledge. The mine is favorably situated for workiug, plenty of wood and water being easily accessible. From present indications, this will develop into one of the best properties in the county.

Near the above location McKenzie & Shoemaker have a location which looks promising. They are engaged in running a tunnel on their ledge, which is four feet wide and the ore is of a good milling character.

Mather & Maitland, who have charge of the Nash gravel mine, have twelve men at work getting the claim into shape for next season's work.

NEVADA.

ESMERALDA'S NEW CAMP.—A correspondent of the Dayton *Times* says:

Six months have made a most decided change in the aspect of Silver Star mining district. Then but a few prospectors could be seen scratching around on the surface; now houses, cabins and tents are thickly strewn in the canyons and on the hillsides, and all is bustle. A visit to Douglas reminds an old Californian of the early days of that State. Everything seems to be in common, the property of one being free to all.

Ore is being extracted from about twenty different mines.

The five-stamp mill in course of construction by Douglas & Co. will be completed and in running order by the 17th inst. Its present capacity will be about ten tons per day of twenty-four hours. The ore will be amalgamated in the battery and run over copper plates. The ore being free, it is believed that there will be no necessity for the use of pans, but should tbe same be required it will be an easy matter to put them in. Water is carried to the mill through pipes from a spring 2000 feet distant.

An election precinct has been established here, and sixty voters have been registered up to the present time.

KENNEDY NOTES.—*New Era:* The Imperial mill is uow continuously dropping twenty stamps and reducing over sixty tons of ore every twenty-four hours.

At the bottom of the winze in No. 3 tunnel of the Imperial is an eight foot vein formation containing two feet of $50 to $60 ore.

The concentrators at the Jenkins mill will be in position the first of the coming week, and soon thereafter the mill will be in runniug order.

If a smelter is constructed in Kennedy, the town will gain importance and population by rapid strides and be the foremost mining camp of the West. With the Imperial mill reducing seventy to eighty tons of ore daily, the smelter 100 tons daily, and the Jenkins mill in operation, Kennedy will indeed be a lively place.

Four pyritic smelters are now in operation, and would be more, but for the lack of fields of the right kind of ore. The ore must contain a certain percentage of sulphur and iron, and be capable of fluxing itself as in the ordinary furnace. In Keunedy the conditions are perfect, and no doubt that before long there will be one of these smelters running at full blast in our camp.

Mr. Austin has been in communication with Manager Wardner for many months and has made tests of samples of Imperial sulphuret ore sent to Denver, resulting in a dispatch being received Tuesday to the effect that he would leave Denver on Thursday for Kennedy, prepared to complete arrangements for building a $60,000 pyritic smelter in Kennedy.

The mines in the basin west of town will compare favorably in richness of ore with any on the coast. Wiggins & Wilson are taking out carloads of rock running as high as $500 a ton in free gold. The Shamrock company has a four foot vein of rich ore in the Blacksmith tunnel, and in the lower tunnel is a fourteen foot vein of ore averagiug $18.50 in gold with no silver. The Pride of the Mountain has two to four feet of ledge giving $20 to $100 in free gold per ton. A number of other good claims might be mentioued.

COLORADO.

SAN FRANCISCO MEN INVEST.—*Republican:* The two claims of the Extension Gold Mining and Milling Company, two and a half miles north of Breckenridge, Summit county, have been sold to San Francisco mining men for $100,000, the last payment to be made within sixty days. The company was organized in March, 1892, by Henry M. and George W. Fair, the original locators, who owned the majority of the stock when the deal was closed.

The extension is ou the same vein as the Jesse, which cleaned up $75 ounces last month. The development consists of tunnels and shafts that have exposed over $200,000 worth of ore. With only a ten-stamp mill the cleanup for the first half of September was 125 ounces. It is proposed to increase the capacity of the mill to 50 tons a day, and to make the mine one of the largest producers of the county. The vein is well defiued and extends the full length of the two claims of the company, or 2840 feet. Up to date, it has opened for 300 feet, disclosing a strong and permanent fissure.

SIXTY-FOUR PRODUCERS.—The Durango *Southwest* estimates that there are sixty-four mines and prospects on the Junction slope, most of which have shipped pay ore after paying $20 smelting charges at Durango. A number of these properties are in Oro Fino camp and the ores are decidedly free milling, which meaus plates and tables. A large per cent of the high grade paying properties of La Plata are found in Wall's Gulch, Ruby, and Hefferman, the Junctiou creek slope from Lewis mountain. The sectiou embraces a belt fully six miles long and two miles wide. The veins are large vertical fissures, with a phorphyretic quartz, and spar gangue, the pay streaks varying from six inches to twenty feet. The gold is native aud tellurium. The first grades ruu from $100 to $500 by sorting. The lower grades, below $50, ore remain on the dump, awaiting the advent of cyanide or some other treatment cheaper than smeltiug at $20 per ton.

IDAHO.

THE CLAYTON SMELTER.—The Clayton Mining & Smelting Company started their smelter at Clayton, Ida., last week, for a run of sixty days. The smelter laid idle for a year, and that district was left in a bad shape, with but few men working in the mines. Superintendent Greene, however, put a few men in the mines belonging to the company, and enough ore was taken out to make a short run, and he decided to iuerease the force so as to occupy as much of this fall as possible in smelting. About 2,000 tons of ore is available, and it will be put through. This will require a run of about sixty days. So far about thirty men have been employed the past four months, which with the two months to come and the employment of a full force of men to operate the smelter, the employment of men and teams to produce and deliver charcoal, limestone, etc., will put the citizeus of the district in good shape for winter, so that these operations mean much for the people of Custer county. The mines belonging to this company are in excellent condition, so that if silver should be restored to something near its former value, the district would soon become lively, like it was a few years ago. As it now is, the chief object of the company in makiug a run this fall was to give their old employes an opportunity to earn enough to make it possible for them to remain in the country without suffering for the necessities of life.

MAY USE THE RUSSELL PROCESS.—Boise *Statesman:* The owners of the Golden Star mine have discarded tbeir Crawford mill, and they are talking of treating their ores by the Russell process. A quantity of the ore recently shipped to the Ontario mine, Utah, and subjected to tbat process, gave very satisfactory results.

OREGON.

BAKER COUNTY.—*Democrat:* A one-fourth interest in the Brazos mine has been sold by Thos. Heady for $5000 to Clark Suide.

Messrs. W. O. Reynolds and Thomas Gorman have received $3000, the balance due them on the sale of their Columbian mine to Chicago people. This pays them iu full for the property—$6000 in all. The purchasers will now continue their arrangements for erecting a mill and puttiug the mine in shape as a producer.

MONTANA.

GRANITE COUNTY.—A writer in the Philipsburg *Mail*, in speaking of the promising gold properties at the head of Gold creek, in Granite county, says: Sullivan & Burrier have a group of six claims, the only extensively developed one being the El Dorado. Their assays range between $5 and $150 per ton, gold, and only one or two ounces silver. A very valuable feature of their ore is especially after the recent experience of the Royal Gold Company, whose 200 tons of concentrates yielded $20,000—the adaptability of its sulphurets for concentration, but the bulk of it is free milling.

Inter-Mountain: The principal event in mining circles during the week was the bonding of the Poulin to Silas F. King for $127,500. It is understood that Mr. King is being backed by a rich syndicate and that operations will shorly be commenced on a large scale.

Reports from Whitehall are to the effect that a genuine miniug boom is on in that locality. The framework of the 150-ton concentrator of the Golden Sunlight group is up and ready to be housed in. The boiler and engine are on the ground and everything is ready for the placing of the machinery in position. About eighty men are employed at both ends of the tunnel. The air is said to be bad and slow progress is being made, but when the tunnel is connected there will be no trouble on this account. A tramway will be erected to transport the ore from the mine to the smelter.

NEW MEXICO.

"WITHOUT THE AID OF COURTS."—The Cochiti gold field is disputed territory, and the case is now iu the courts. At a recent meeting of miners there these resolutions were adopted:

WHEREAS, A rumor has been current that tbere are parties contemplating jumping claims that have been regularly located according to the United States and territorial laws, in case the land courts decide agaiust the land claimants; therefore, be it

Resolved, By the members and prospectors of the Cochiti mining district, in meeting assembled, that they do hereby warn such persons that any act of this kind will not be tolerated, and such persons will be punished without the aid of the courts; and be it further

Resolved, That this shall apply to the claims of all persons, whether present or absent, if they have been regularly located.

Bland, N. M., September 28, 1894.

SOUTH DAKOTA.

Pioneer: Captain St. John, of Bear Gulch, was a visitor in Deadwood yesterday. He only visits the city once in a while, and is a man thoroughly posted on all Bear Gulch and neighboring mining counties. Placer mining has been very successful this last summer; the gold produced has paid very good wages. The shutting down of the mines in Terraville and Central caused an influx of people hunting placer mines, and Bear Gulch got its quota of the willing workers. The tin claims in that country have been worked this summer and several good veins have been uncovered which will pay from 1¼ to 2½ per ceut of tin, while lots of sample pieces run from 25 to 50 per eent. Letters are received daily from parties all over the United States, asking about the tin in that country. The Harney Peak Tin Mining Company have advertised this industry of the Hills and Bear Gulch miues have come to the front since the closiug down of that camp. China and Japau are uow using tinware for everything, the cheapness

being its best recommendation, and it will not be long until the mines in the Bear Gulch country are rivaling the gold mines of Yellow creek.

UTAH.

GENERAL NOTES.—*Tribune:* The Bullion-Beck Company has begun to construct the plans for a 200 ton concentrator which is to be put up at once at Eureka. The site has been selected and the contracts let for some of the machinery. The new mill will treat ores after the manner of the big Lead mill at Bingham. The company expects before very long to have its own smelter, as well as concentrator.

The new West Mountain placer mine will be in active operation, with mammoth pumps going, next week. The first pump is now down about ninety feet, and a shaft is being sunk at the rate of fifteen feet a day for the second one. Bedrock will probably be reached within 150 feet.

Down in the Gold Mountain country the Sevier Mining & Milling Company has mastered the water problem and is in a fair way toward turning out some rich ore very soon. A ten ton concentrator is in operation.

The presence of some rich ore is reported from the reservation country.

The Ibex Company is progressing rapidly with the construction of a 100-ton smelter at Leamington. Final completion, however, as also the renewal of shipments from the Ibex mines, will wait upon the extension of a small spur of the Union Pacific Railroad.

New smelters and mills seem to be the order of the week. Besides the Bullion-Beck and Leamington is a 150-ton plant being erected in the Geyser group. A mill with that capacity has recently been transferred from Bingham by the Geyser Company and is now in course of erection at Mercur.

The Centennial-Eureka, which declared a double dividend last week, is about to put in a mammoth air compressor, and only awaits the arrival of the machinery to finish with the work. It is expected to arrive early next week.

In addition to the several definite things mentioned, there are a number of mining schemes of some magnitude afloat, which may not appear in print for some time, but which are of great importance to the Territory and to the mining interests.

BULLION-BECK'S BIG PLANT.—The test of the Lead mill at Bingham has proved so satisfactory to the directors of the Bullion-Beck mine that they have determined to proceed at once with the construction of a mill for the similar treatment of ores at their mine. Yesterday evening Messrs. Beck, Ryan, Cunningham, Knox and Bamberger proceeded to the mine to oversee the inauguration of the work on the plant. They took with them Mr. L. C. Trent, the mining machinery dealer, and a Mr. Kirby, who has been foreman at the Jordan mill at Bingham and who conducted the test on the Bullion-Beck ores. Mr. Kirby is to be made foreman of the new mill.

The Bingham mill will be much enlarged upon in the plant at Eureka. In place of the fifty-ton capacity a 200-ton concentrator will be erected. Owing to the greater hardness of the Bullion-Beck ore the machinery has to be much heavier and more powerful than in the Bingham mill. Of course the construction of new housing will be necessary, together with many other incidentals and accessories. The company announced yesterday that it would erect a new lathe, and install an entire machine shop equipment, the outlay necessary for which will be quite heavy.

Another feature of the new work will be the use of patent framers for all the timbers.

Altogether, the improvements will tend to increase the output of the mine considerably, and to enable the company to profitably treat thousands of tons of ore that has heretofore been thrown away.

MERCUR DISTRICT.—The opening up of the Big Sunshine mine is verifying all anticipations. The sinking of the shaft to determine the width of the vein shows sixty feet of ore. The grade is not high, but it is rich enough to promise big returns. Report is to the effect that a mill will be erected at the mine as soon as the development work is completed.

BRITISH COLUMBIA.

MINES OF THE SLOCAN.—Byron N. White, general manager of the Slocan Star mine, reports the Nakusp & Slocan railroad completed to Three Forks. "The Slocan country is the most prosperous section of the entire northwest, in my opinion," said he. "The output of the mines this winter will be more than double the entire output of the country up to date. The Grady group, on Four Mile creek, is shipping forty tons of ore a day to the railroad at Wilson creek by steamer from Silverton. This ore goes to Omaha via the C. P. R. It is reported to run about 125 ounces of silver to the ton and about seventy per cent lead. The Fisher Maiden is also getting ready to ship a lot of high grade dry ore.

"The people of Three Forks are building a wagon road to the Idaho basin. This will serve the Idaho, Alamo, St. John, Cumberland, Democrat, Young Dominion, Queen Bess and many other mines. The output of this one basin this winter should not be less than 3000 tons. We have 850 tons of ore from the Slocan Star at Three Forks now, and we will begin shipping from the mine again as soon as snow falls. Our output will be 1000 tons or more this winter. On the Noble Four group they are mining and sacking ore now, and will probably ship 2000 tons. The Deadman is being opened up and will make big shipments, as will the Reco, which should be good for 1000 tons or so. The Bluebird has been worked all summer and will have from 500 to 700 tons to ship. S. S. Barley has put up new cabins at the Payne and will ship from 300 to 500 tons. The Idaho No. 2 and Danderberg will make good-sized shipments like their neighbors. The McDonald Bros. are in shape to ship 500 to 700 tons, and the Dardanelles and other big mines in that vicinity will be big producers, but their ore will probably go by Kalso. There are plenty of men in the country and I advise none to go there in search of work."

NELSON.—*Miner:* At Forty Nine Creek the Nelson Hydraulic Mining Co. has struck it rich. The company has been steadily going on piping although the water supply was not quite what it might have been. In the course of their work at the end of the last week a bank of hard cement gravel was uncovered, which on being tested has given excellent results.

Coast Industrial Notes.

—A deposit of phosphates, such as are used in France as fertilizers for vineyards, has been discovered near Reno, Nevada.

—The Carson and Tahoe Lumber and Flume Company is reported to have bought the Sierra Lumber Company's business for $450,000.

—Vancouver, B. C., has decided to borrow $100,000 to erect an electric-light plant, to light the streets and for private consumers.

—Eastern men are negotiating for the purchase of 50,000 acres sugar pine on the Stanislaus, with intent to saw most of it into lumber.

—The California Petroleum and Asphalt Company of Santa Barbara is putting in an entire new plant. It is built by the Vulcan Iron Works.

—M. L. and D. Marsh, of Nevada City, have a contract to furnish 15,000 ties and 500 trolley poles for the new electric railway between Nevada City and Grass Valley.

—The H. G. Layng Machine Works has incorporated. Capital stock, $50,000. Directors—H. G. Layng, John Burke, John E. Layng, William E. Layng and Robert J. Layag.

—A Leadville miner says: "The gold bugs are the real fiat champions, as they offer a paper currency which they tell us will be redeemed in something the Government has not."

—Scott & Greenberg have incorporated, with a capital of $20,000, fully subscribed. Directors—Henry H. Scott, A. H. Greenberg, Marie Greenberg, William Kaiser and Frank Corde.

—The J. B. Cohen Company has incorporated. Capital stock, $20,000, fully subscribed. Directors — B. Cohen, Bruce Palmer, Edgar A. Cohen, A. B. Costegan and Donald A. Cohen.

—The Electric Power Company of Los Angeles has incorporated, with $1,000,000 capital, of which one-half has been subscribed by P. Kehl, E. C. Seymour and W. E. Van Slyke, of San Bernardino.

—Last week the Beason extension on the Arizona and Southeastern Railroad was finished, joining Benson with the Southern Pacific. The new extension parallels the Santa Fe tracks for eighteen miles.

—Northern Pacific earnings from the 1st of January up to September 7th were $8,957,767. For the remaining months of '94 the earnings will possibly reach $5,000,000, making the total earnings close to $14,000,000.

—A Williams, Arizona, lumber company has contracted to deliver by Feb. 1, '95, 1,500,000 feet of lumber to the United Verde Copper Company, and 13,200,000 feet to the Santa Fe, Prescott and Phœnix Railway.

—The Pacific Concrete Company has incorporated, with a capital of $75,000, of which $2500 have been subscribed. Directors—John W. Miller, Walter Foster, Louis Zimmerman, Harry F. Ingerson and Otto tum Suden.

—California produces annually 9,000,000 lbs. of cheese, and 31,116,000 lbs. of butter. The total value of dairy products amounts to $14,425,880, a sum which exceeds the total value of the State's fruit, grapes, wine and sheep.

—The San Francisco Sulphur Company has filed articles of incorporation. Capital stock, $50,000, fully subscribed. Directors—John Reynolds, J. L. N. Shepard, John Stauffer, John A. Wheeler and George T. Reynolds.

—The Southern California Lumber Company has incorporated, with a capital stock of $500,000, of which $2500 has been subscribed. Directors—E. C. Flagg, E. F. Burrell, E. A. Burrell, E. D. Connolly and T. E. Driscoll.

—Interest in the recent new oil discoveries at Los Angeles is unabated. A multitude of wells are sinking and the results in almost every case are satisfactory. Los Angeles is in a fair way to solve the problem of cheap fuel.

—The Ellensburg, Wash., Coal Company has been prosecuting work on its property near Cle Elum, and expects by the 10th to be delivering coal to consumers. They have a vein over five feet wide, and the quality is said to be superior to the coal mined at Roslyn.

—Spokane is figuring on putting in a city electric light system, by substituting dynamos for one of the pumps at the water works power-house. The plant would cost $40,000. The city pays $8 per light for arc lights, and it is claimed it could in this way get them for $4.50.

—A. J. Hayward of Tacoma, Wash., proposes to harness the Nisqually river by means of a thirty-foot dam, and thereby secure power enough to operate the city electric lighting plant and other plants as well. He estimates the cost of carrying out the project at $75,000.

—It is reported that a large packing house is to be started at Portland by Cudahy of Chicago. A recent report of the Department of Agriculture gave the number of swine in the Pacific Northwest, as follows: Oregon, 210,749; Washington, 162,977. The total number of swine in California, the report says, is 435,663.

—The salmon season in Alaska has closed. It is estimated that the catch will aggregate 700,000 cases, which, with what has already been sent down, will consume several months in shipping. Large quantities have been shipped to China and Japan, and other foreign orders have been large. The catch is larger than for some years past, and the fish are of good quality.

—The State Board of Fish Commissioners has filed its report with the Governor, showing what has been done in the past year toward advancing the fishing interests. In connection with the report it is shown that in 1880 the output of oysters for the entire Pacific coast was only 15,000 bushels, valued at $10,000. In 1892 the output of California alone was 178,645 bushels, valued at $698,257. This is the result of propagation and distribution. The Board recommends an extension of time of the salmon closed season.

—A New York dispatch says the General Electric Company has closed a contract with the Sacramento Electric Light and Power Company that calls for the transmission by electricity from a water power at Folsom, California, twenty miles distant, of several thousand electrical horse-power to the city of Sacramento to supply light, heat, power, etc., to an extent that will practically supersede all the present steam plants now in operation. This will make the longest transmission by electricity of power in large amounts installed in the world.

—The Portland, Or., papers say there are 3000 empty houses in that city. A million-dollar fire last Sunday night burned the Pacific Coast Elevator Co.'s main building and dock there, the coal bunkers of the North Pacific Terminal Co., the Oregon Railway & Navigation Co.'s dock, and the new plant of the Portland Electric Co., which had just arrived from Lynn, Mass., and had not yet been unloaded from the cars. Two hundred freight cars, eighty of which were loaded with wheat, 12,000 cases of salmon, and the steamboat Willamette Chief were also burned. The insurance aggregates $600,000. Notwithstanding all these losses and setbacks, Portland is a solid city and is only suffering temporary embarrassment.

Official Award.

Mr. Geo. E. Woodbury of this city is in receipt of the following: U. S. Department E, Mines and Mining: Exhibitor, Geo. E. Woodbury, San Fraacisco, Cal: Exhibit, an improved conceatrator with improved belts and feeder.

AWARD.

The construction is simple and strong. By a number of narrow belts the pulp to be concentrated is equally distributed, and is prevented from running one side to the other by reason of too much pulp on them. By expanded edges of the belts they are prevented from cracking; very good feeding arrangement; self-oiling shafts and boxes. The exhibit consists of a concentrator with seven narrow belts on one frame, which are so arranged as to receive a portion of the pulp on each belt in such a manner as to relieve the machine of its load. Signed: Reiji Kanda, Individual judge. Approved, H. M. Howe, President Departmental Committee; Jas. Boyd Thatcher, Chairman Ex. Com. on Awards.

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Electrical Progress.

The Prevention of Electrolysis.

At the annual meeting of the American Water-works Association, a report from the special committee appointed to consider the matter of the electrolyzation of water mains was submitted by Mr. Benzenberg. The recommendations submitted were:

To accomplish the prevention of electrolysis it is but necessary to prevent the pipe at any point from becoming positive to the rail or any other possible conductor. Whether the pipe is positive or not can be easily determined by a few observations with a voltmeter at points radiating out from the power house and along the line, where, by a perceptible difference in the potential between rails, the existence of poor or defective rail bonds is located. The facts and the points where the pipe is positive having been settled, the railway company should not lose a moment to re-establish the proper conditions for the protection of the pipe.

If not already provided, ample and suitable connection by an insulated cable should at once be made between the pipe and the generator to afford the least resistance for the proper escape of the current to its destination. If this has already been supplied, or the pipe is still positive, the rail bonds at such points should be perfected, and if the couditions are such that an increase of the section or number of such bonds will not entirely remove the difficulty, proper and suitable metallic connections should be made at such places betweeu the pipe and rail so as to permit the turn of the current to the rail until the proper equilibrium, dependent upon the relative resistance, has been established, without the necessity of passing the current through an electrolyte and of developing electrolytic action in the accomplishment of such result.

Insufficient rail section, inadequate return feeders, or especially wet soil, presenting an easy avenue for the current to reach the pipe, may make it necessary to add to the number of such connections, but they should only be made where the pipe is positive, in order to relieve the pipe, and for no other purposes. If this method be followed no damage, it seems, can arise to the pipe, but, to the contrary, the best possible protection given it against an agent whose permeating power it is impossible entirely to escape.

The only question which may arise iu connection herewith is as to the uniform conductivity of the pipe, whether there is sufficient resistance in the lead joints to cause some of the current to pass around and in doing so produce electrolytic action.

In a measurement made recently at the lead joint of an eight-inch water main in front of the power house of the Milwaukee Street Railway Company, through which main sixteen per cent of the entire output of the station (or 421 amperes) is being returned (thirty-one per cent being the entire amount returued through the water mains), a drop of potential of but 0.0198 volt was found to exist between the ends of the pipe, indicating a resistance of 0.000047 ohm, certainly uot sufficient to produce electrolysis even with the most favorable conditions existing at the joint.

But, do any favorable conditions exist? Professor Jackson, by his great number of experiments, has established that "in no case is the corrosive action due to the electrolysis of water; where oxygen is liberated at the anode, it does not attack the iron." And again: "In order to have the first electrolytic process go on—that is, direct electrolysis of iron—a soluble iron salt must be present in the soil, reaching from anode to cathode. The analysis of street soils shows no such salts."

Corrosion at the joints, therefore, can only be caused by the electrolysis of the soluble salts heretofore mentioned, if they exist between the hub end and the adjoining pipe at the joint. A most careful examination of the pipes and the lead joint in the eight-inch main above referred to, did not show the least perceptible action of corrosiou, although the main had beeu used as a conductor for years. It does not seem, therefore, that there is the least call for any anxiety that corrosive electrolytic action may take place at the lead joints, and, hence, a water main of like diameter may safely be considered to possess a uniform conductivity throughout and capable of conducting without injury so much of the curreut as under the law of divided circuits it cannot avoid conveying.

The eight-inch water pipe, where the same is connected by a 500,000 circular mil cable to the generator, was subjected on either side of the connection, in and under the clamps, to a most careful scrutiny and examination, but, notwithstanding the clamp aud the cable had not been touched for fifteen months, not even the least discernible change could be detected at any point. Where the iron pipe had been filed to form a contact with the clamp, the fine markings of the file were as sharp and distinct as on the day they were made. Other connections between the rails and pipe which were examined were found to be in good condition, and all possible information so far indicates that all corrosive electrolytic action on or along the pipes has been arrested.

Undoubtedly, electric street railway companies will soon, if they have not already, learn to appreciate the economy stored in a perfect return circuit of least possible resistance, and perfect, by improved copper bonds and return cable feeders, their present, in mauy instances, inadequate system.

The line of iuquiry and investigation for the water-works engineer to pursue and the remedy, if needed, to be demanded at the hands of the railroad company has been made clear at least by the investigations and experiments which have been made; and he can now, by his own observation, ascertain whether or not any part of his pipe system is endangered.

Ball Bearings for Motor Generators.

According to a description of a uew electric plant in Manchester, England, we learn that the motor generators are fitted with ball bearings. In commenting upon this an English engineer said the object of introducing this form of bearing was to reduce friction. A dynamo, with which he had been connected, had been running at a very high speed for a considerable time, aud the result had been a gain of ten per cent over ordinary bearings. In order to attain a successful result with ball bearings, the balls themselves and the races must be of the highest quality steel, and as hard as possible. Formerly wrought-iron balls had been used, and these had been casehardened, but the material was not suitable for the work, as the casehardening wore off and the iron gave way. It was desirable that the bearings themselves should be self-contained and easy to adjust; in some forms of ball bearing it was necessary to hold the balls in with fat when putting the bearings together. The ball bearing was held by a split cap, which acted as a spring, to some extent, so that it could be set up by tightening a single pair of nuts. The balls varied betweeu one-eighth inch up to two and one-half inches. The larger sizes were not hardened; the reason for this was that with these big diameters it was impossible, at present, to satisfactorily harden the races, and those using large ball bearings concluded that it would be better to keep both the ball and race soft, rather thau harden one and not the other. A lathe spindle was shown which was fitted with a ball bearing, and which had been running for five years continuously without showing any appreciable sign of wear.

In the United States Circuit Court at St. Louis, last week, the case of the Adams Electric Company against the Lindell Railway Company was decided in favor of the defendant. The suit involved millions of dollars and the issue was the validity of several inventions of electric motor devices, as applied to street railways. The Lindell Railway Compauy was the nominal defendant. The real defendant was the General Electric Company.

The law that a conductor cutting lines of force has au estimated motive force developed in it depending upon the number of the lines and the speed with which it cuts them, operates in a motor so as to produce a force in the armature in a direction opposing the excitiug force. On account of this counter estimated motive force the current which cau be sent through a motor armature by a given estimated motive force varies with the speed at which the armature is runuing; if it be forcibly prevented from turuing, the current is greatest, being simply due to the estimated motive force divided by the resistance, but when the armature is allowed to revolve the current decreases as its speed increases. This tends to make the motor self-regulating as to current absorbed in proportion to load and as to speed, for if the motor is having heavy work to perform, the the speed tends to become reduced, aud, therefore, the counter estimated motive force allowing more current to pass the armature, more power is given to do the increased work. Lighter work tends to allow the speed to increase, which develops more counter estimated motive force in the armature, reducing the current and cousequently the power.

The very latest style of alternating current meter cousists of two vertical electro-maguets, the pole pieces of which are drawn out into peculiar curved horns, so to speak. Around the horns are wrapped at intervals thin copper bauds. Betweeu the horns or pole pieces is placed a light copper wheel attached to a spindle, to which are attached light mica vanes to cause the necessary drag. The current passes through the electro-magnets and causes liues of force to traverse from one horn to another. The passage of these maguetic liues of force, however, through the copper bands, tends to induce momeutary currents in them, and these momentary currents tend to obstruct the passage of the magnetic lines of force, which do not all traverse the pole pieces at their tips, but puff out, so to speak, at every baud of copper, and induce currents in the copper wheel, which cause it to be repelled and continuously rotated. The wheel actuates the usual counting gear. Of course this meter will only register alternating currents.

With constant current supply there has been no difficulty in driving motors, and one of the advantages urged in its favor was this fact; but uow the alternatiug current motors are receiving considerable attention from our electrical engineers. Many attempts have been made to produce such motors from designs like those of direct current ones, except that their field magnet cores had to be laminated as well as those of the armatures. Owing to troubles with self-induction and magnetic lag, motors constructed in this manner proved to be most inefficient. The motors which run with good efficiency, and which are likely to be largely used in alternating circuits, have for their principle the induction of currents in closed or "short-circuited" coils in the armature by an alternating field.

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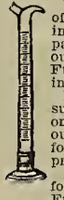
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Practical Information.

The Laboratory of the Oceans.

Whoever used the phrase "the great laboratory of the oceans" must have meant that the sea is the constant recipient of chemical elements carried by contributing streams for thousands of miles, the variety of which must be equal to the differences in the surfaces of the lands traversed by them. A recent writer in one of the reviews said that all the known elements—and even the unknown ones, too—must be contained in solution in the waters of the ocean. Rivers flowing over the land are continually taking up mineral matters in solution, and these substances are all added to the mass of mineral dissolved in the oceanic waters.

The Thames every day carries to the North sea some 2000 tons of dissolved material, and if all the rivers of the globe work at something like the same rate, 20,000,000 tons of mineral matter must day by day be added to the store of materials held in solution by the ocean. Now, all the chemical elements are capable of entering into compounds which are to a greater or less extent soluble in water, and hence we cannot doubt that in the enormous mass of materials dissolved in the vast body of sea water on our globe all the elementary bodies must be represented. It is true that the chemist, by his most refined methods of analysis, is unable to detect the proportion, even if he is able to determine the presence of the rarer elementary substances, which occur only as minute traces in sea water. When a large quantity of sea water is evaporated, we get a mass of chlorides and sulphates that can be separated by analysis; but even the very delicate tests of spectral analysis fail to make manifest many of the rarer metals and other elementary substances that must certainly be present in the mass. In a well-known case, the copper sheathing of a vessel has been proved to have taken up silver from the sea water by electro-chemical action, though it is probable that all our ordinary analytical processes would have failed to reveal the existence of the metal in the water itself.

A Bed of Natural Coke.

In the coal mines at Carbouado a miner, one day in working upward through one of the coal chutes, stuck his pick in the roof and was surprised to find a small deluge coming down upon him, says the Tacoma, Wash., *Ledger*. He was considerably alarmed and, as the water continued to pour through for some hours, it was thought that a hidden lake or river had been tapped. The opening was widened and the water soon drained out, when it was discovered that a surface fire many years ago had burned out the upper edge of the vein, which is tilted at an angle of 45 degrees, to a depth of about 70 feet, for a distance of nearly 200 feet.

Having burned down this far, the tilt of the vein made a sort of oven, in which coke had been formed. Then, apparently, the rainy season had come on and quenched the fire. In succeeding years the earth had closed over the great gap thus made, and above it several very large trees, one of them at least 500 years old, had grown. As the tree could not have grown, or even sprouted, when the fire was burning and, as it would have been destroyed by fire had it existed at that time, it furnished pretty conclusive evidence of the age of the coke. Some hundred pounds were taken out and brought to Tacoma and used. It was as good coke as had ever been found in the country, notwithstanding its extreme age.

CLINKERING depends upon two things —the temperature at which the coal is burned, and the composition of the ash. The fact that a coal does not clinker may be due to its impurity, the poor quality of the coal preventing it from making a fire hot enough to fuse the ash. On the other hand, a very pure coal may clinker, because it burns at a high temperature and melts its ash. A coal must have heat enough to melt the silicates it contains in order to make clinker. Generally the more bases there are in the ash the more fusible it is. Two coals, either of which burns without giving much trouble on account of clinkering, may clinker more if they are mixed, the reason being that the combination of the ashes of both is more fusible than is the ash of either separately.

Deep Mining.

At the recent meeting of the Iron and Steel Institute at Brussels, some interesting facts were recorded concerning the deep mine shafts of that country. As long ago as 1844 the late Prof. Devillez, of the Mons School of Mines, declared that shafts to a depth of 1000 meters could be successfully ventilated and worked, and his assertions are now borne out by current practice.

At Viviers the depth is 3760 feet, at Viernoy 3300 feet, though both these have been abandoned for lack of coal in paying quantities. At Prodict's colliery the shaft is 3800 feet, with an incline reaching to 3950 feet, the greatest depth yet reached in Belgian coal fields. The pumps required for drainage are necessarily powerful though small to come within the limits of restricted room. Foundations are sometimes omitted and the pumps bolted direct to iron beams built into the masonry. The pump at St. Catherine's shaft of the Boscoup colliery forces the water to a height of 1180 feet, while at La Louviere the head of over 1875 feet is handled by one pump on a direct line of piping.

THE money value of hands and fingers has been made the subject of an interesting estimate by one of the German miners' accident insurance companies. According to this, the loss of both hands represents a loss of 100 per cent efficiency, or, in other words, the whole ability to earn a living. Losing the right hand depreciates the value of an individual as a worker 70 to 80 per cent., while the loss of the left hand represents from 60 to 70 per cent of the earnings of both hands. The thumb is reckoned to be worth from 20 to 30 per cent of the earnings; the first finger of the right hand is valued at from 14 to 18 per cent; that of the left hand at from 8 to 13.5 per cent. The middle finger is worth from 10 to 16 per cent. The third finger is valued at no more than from 7 to 9 per cent, while the little finger is worth from 9 to 12 per cent. The difference in the percentages, it is explained, is occasioned by the difference in the trades followed by the injured ones.—Cassier's Magazine.

No. 6.

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BRANCH OFFICES:
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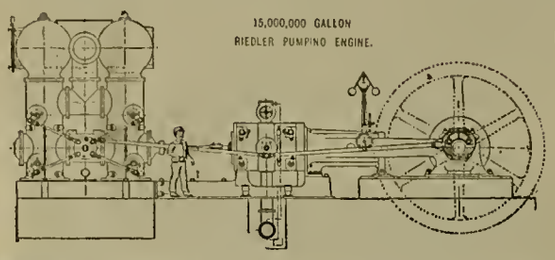

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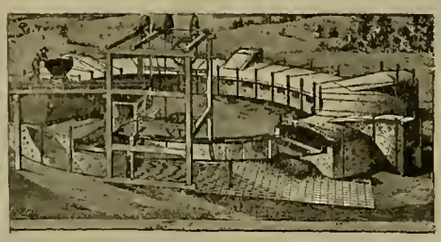
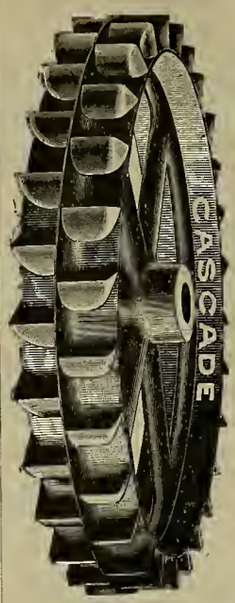


Crushers, Hoists,
Pumping Engines, Corliss Engines,
Boilers, Mechanical Stokers,
Lead Smelters, Pyritic Smelters,
Gold Mills, Silver Mills,
Mill and Mine Supplies.

WATCH FOR NEXT WEEK'S AD.



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Every description of work plated. Send for Circular.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 4, 1894.

The stiffening in the New York lead market and the limp condition of silver make the chief luterest of the week. Big shipments of silver continue from here and New York to the far East, the New York shipments going via London. Outside of the United States, the circulatory requirements of the white metal continue. From January 1st to September 15,'94, London exported silver as follows:

India	£3,904,315
China	2,119,573
Straits	949,946
Total	£6,973,834
Same part of '93	6,874,255
Increase	£99,579

It will he news to many that from July 1st, '93, to July 1st, '94, the official returns of the exports of silver from the United States show a total for the year of $50,451,265.

The Director of the Mint has estimated and the Secretary proclaimed the present value of foreign coins. The changes are as ollows:

Bolivlars of Bolivia	$0.464
Peso of Central America	.464
Shanghai tael of China	.686
Haikwan tael of Cbina	.763
Tien-Tsin taels of China	.727
Chee Foo tael, China	.717
Peso of Colombia	.484
Sucre of Ecuador	.464
Rupee of India	.222
Yen of Japan	.450
Dollar of Mexico	.504
Sol of Peru	.464
Rouble of Russia	.571
Mahbub of Tripoli	.418

Copper shows firm, and though the output, both in this country and Europe, is on the increase the price has gone steadily up iu the last few weeks. It is quoted in Loudon at £42 5s, the highest in '94. For the first eight months in '94 this country produced 109,285 tons, aud Europe 59,620 tons.

There is some talk of "a new tin syndicate." Contradictory accounts come of lowering wages and threatened abandonment of new enterprises in that dircetion, under new tariff arrangements.

A writer in the Liverpool *Daily Post* says: The principal way in which it has beeu suggested as possible to reduce the cost of making tin plates in Wales to meet American competition, is by reducing the wages of the work people, or by the latter granting "concessions," which comes to the same thiug. To either of these methods the men's union have in the past offered, and coutinue in the present to offer, the most uncompromising opposition, preferring, as has been frequently declared, that the trade should leave South Wales and go to America as the alternative to any reduction of wages.

In coal there is in general a big supply and weaker prices.

For the first nine months of '94, exclusive of Mt. Diablo coal, the receipts here hy water were as follows:

	Tons.
Puget Sound	306,652
Oregon	21,100
Eastern	13,298
Australia	135,885
British Columbia	356,924
Englisb	92,786
Scotch	7,307
Welsh	19,201
Japan	13,137
China	2,500
Total	968,790

New York Prices.

NEW YORK, Oct. 4.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.	Tin.
Thursday	29¼	63½	....	....	....
Friday	29¼	63⅝	9 25	3 15	19 25
Saturday	29⅛	63¼	9 30	3 16	....
Monday	....	....	....	....	....
Tuesday	29⅞	63¾	9 40	3 18	19 10
Wednesday	29	62¾	....	....	....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed secnrities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	62¾
Mexican Dollars, nominal	53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	11
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs	$1		55
Drop, B and *larger* sizes, " "	1		75
Buck, Balls and Chilled, do, " "	1		85
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	18
ZINC.			
Sheet	8½	@	9

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 7		75
Greta	7		50
Nanaimo	6		25
Gilman	5		75
Seattle	7		00
Coos Bay	5		50
Cannel	8		00
Egg, bard	9		50
Wallsend	7		00
Scotch Splint	7		00
Brymbo	7		50
West Hartley	7		75

TO ARRIVE—PER TON.

Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Splint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —

COKE.

English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Oct. 4, 1894.

The week was livelier in share dealing than for many previous months, there being a larger volume of business and a general advance in prices. The reports from the mines continue encouraging.

Following is a statement of the cash on hand in the office of some of the mining companies on the 1st inst:

Alpba	$3,538	Hale & Norcross	$14,968
Alta	644	Julia	429
Andes	14,669	Kentuck	3,643
Belcher	4,700	Mono	1,187
Best & Belcher	9,618	Mexican	12,674
Bullion	13,906	Nevada Queen	447
Bulwer	3,335	Occidental	609
Bodie	48,452	Ophir	488
Caledonia	5,385	Overman	7,794
Challenge	720	Potosi	30,233
Chollar	16,507	Savage	9,073
Church	17,283	Scorpion	174
Con. Imperial	1,768	Seg. Belcher	6,698
Confidence	3,355	Silver Hill	240
Con. New York	2,672	Silver King	2,025
Con. Cal	135,732	Sierra Nevada	20,217
Crown Point	3,981	Standard Con	31,409
E. Sierra Nevada	243	Syndicate	881
Excbequer	3,508	Union Con	9,310
Gould & Curry	12,991	Utah	189

The indebteduess of other companies on the 1st is reported as follows:

Commonwealth	$26,446	Navajo	$473
Grand Prize	640	North Belle Isle	2,368
Independence	567	N. Commouwealth	2,587
Lady Washington	350		

The monthly bullion statement of the Consolidated California and Virginia for September is as follows: Worked at Morgan mill 1586 tons of ore. Bullion produced — Gold, $88,163.72; silver, $45,715.88; total, $83,879.60. Yield in bullion per ton—Gold, $24.05; silver, $28,81; total, $52.87. Assay value of the ore per ton per battery samples—Gold, $24.13; silver, $35.10; total, $59.24. Assay value of the ore per ton per railroad car samples, $57.89.

In the Savage on the 1100-foot level in the north lateral drift from the east drift they continue to stope ore from the sill floor upward to the fourth floor. The south drift started from the face of the north lateral drift, was advanced twenty-one feet; total length, forty-one feet; face in quartz giving some assays. During the week they have hoisted fifty-seven cars of ore from this level. Car samples average $80.40 per ton.

On the 1050 level the south drift started from the east drift thirty feet from the south ore stopes was advanced eight feet; total length, eighteen feet; face in quartz giving some fair assays. The west crosscut started thirty feet north of the south boundary was advanced ten feet; total length, forty-eight feet; face is in quartz and porphyry. On the 1100 level the north lateral drift from the station was advanced twelve feet; total length, 351 feet; face is in quartz, clay and porphyry. The east crosscut started from the north lateral drift opposite the west crosscut was advanced forty-two feet, when it reached the last clay of the vein, and was discontinued. At a point in the north drift, thirty-two feet back from this crosscut, they have encountered some ore of good grade on the west side of the north drift. Have completed a new working station on the 950 level.

The following illustrates the changes of the week:

MINES.	27	4
Alpha	$ 14	$ 20
Alta Consolidated	20	19
Andes	70	76
Belcher	87	97
Best & Belcher	1 55	1 75
Bodie	1 35	1 80
Bullion	35	40
Cballenge	55	62
Chollar	63	75
Confidence	....	1 60
Consolidated California and Virginia	4 90	5 ⅞
Consolidated New York	05	1 05
Crown Point	87	1 05
Excbequer	....	....
Gould & Curry	85	1 05
Hale & Norcross	74	1 15
Justice	26	28
Mexican	1 65	1 75
Opbir	3 75	3 95
Overman	32	33
Potosi	82	90
Savage	76	87
Sierra Nevada	1 30	1 40
Union	90	1 00
Utah	59	08
Yellow Jacket	95	1 20

20-Stamp Mill for Sale.

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MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12,	Oct 17, Nov 7	J E Jacobus, 309 Montgomery
Bay State M & D Co, Cal	22	3c	Aug 25,	Sept 29, Oct 24	F E Luty, 330 Pine
Belcber M Co, Nev	49	25c	Sept 14,	Oct 18, Nov 8	C L Perkins
Brunswick Con G M Co, Cal	7	2c	Aug 22,	Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Sept 15,	Oct 16, Nov 5	E B Holmes, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3,	Nov 8, Dec 3	J W Pew, 310 Pine
Ophir S M Co, Nev	63	25c	Sept 5,	Oct 9, Oct 29	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	12	30c	Sept 4,	Oct 15, Nov 12	J W Pew, 310 Pine
Utah Con M Co, Nev	20	5c	Sept 28,	Nov 1, Nov 20	A W Havens, 309 Montgomery
Yellow Jacket S M Co, Nev	57	25c	Aug 2,	Sept 5, Oct 10	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Carson Creek M Co, Nev	A K Durhrow, 309 Montgomery	Oct 15
Con Cal & Va M Co, Nev	A W Havens, 58 Nevada Block	Oct 15
Cosmopolitan M Co, Nev	B Burris, 240 Montgomery	Oct 8
Eureka Con M Co, Nev	H P Bush, 134 Market	Oct 15
Exchequer M Co, Cal	C E Elliott, 79 Nevada Block	Oct 15
Mayflower G M Co, Cal	D M Kent, 330 Pine	Oct 15
Quincy M & W Co, Cal	W C Ralston, Room 2, 9th floor Mills Building	Oct 9

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 4, 1894.

FIRST SESSION—9:30 A. M.

100	Alta	19	200		93
1000	Andes	71	200	Hale & Norcross	76
100		72	300	Justice	27
200	Belcber	95	100		28
700		93	500	Kentuck	10
200		94	900	Mexican	1 60
650	Best & Belcher	1 60	1970	Ophir	3 60
50	Bodie	1 65	150	Overman	27
200	Bullion	35	250		28
300	Cballenge	60	300		29
100		58	200	Potosi	79
250		57	300		80
100	Confidence	1 45	300	Savage	74
250	Cbollar	61	450		77
400		62	400	Seg Belcher	21
450	C. C. & Va	5 25	150	Sierra Nevada	1 25
500		5 ⅜	750	Union	97
100	Crown Point	92	500	Utah	08
550		94	1300	Yellow Jacket	1 05
100	Gonld & Curry	92			

SECOND SESSION—2:30 P. M.

100	Alpha	20	200	Justice	27
400	Alta	19	150	Ophir	3 95
1200	Andes	70	200		3 90
50	Belcher	97	700		3 85
200		98	30	Mexican	1 75
100	Best & Belcher	1 70	800	Savage	87
50		1 75	800	Overman	33
275	Bodie	1 80	300	Potosi	88
100		1 75	100		89
2550	Bullion	40	800		90
200	Challenge	62	850	Yellow Jacket	1 20
100		61	50		1 15
200	Confidence	1 60	100	Kentuck	12
650	Con Cal & Va	5 ⅝	250	Sierra Nevada	1 35
450	Chollar	74	50		1 40
300		75	200	Seg Belcher	30
100		73	300		31
200	Crown Point	1 05	400	Union	1 00
200	G & C	1 05	1000	Scorpion	07
1200	Hale & Norcross	1 10	500	Mono	25
400		1 15			

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 25, 1894.

526,552.—PRESERVING PILES—C. Arnoudts, Seattle, Wash.

526,622.—WHEEL—H. P. Garland, Petaluma, Cal.

526,485.—BOILER FURNACE—J. Grogan, Prescott, A. T.

526,480.—BED-CLOTHES CLAMP—H. L. Jessen, Watsonville, Cal.

526,666.—BASIN TRAP—J. Marquis, S. F.

526,581.—HOTEL REGISTER—D. F. Riegle, Portland, Or.

526,511.—TEA CHEST, ETC.—C. Toobey, S. F.

526,512.—SEED PLANTER—Weber, Perscbl & Weber, Los Angeles, Cal.

526,474.—FOLLOWER—C. E. West, Santa Cruz, Cal.

526,476.—WRENCH—W. J. Wright, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FAUCET.—Charles H. Dutton, San Francisco, No. 525,948. Dated Sept. 11, 1894. The object of this invention is to provide an automatically closing faucet which is essentially closed by gravitation or the pressure of the water or liquid which it is adapted to control. It consists of a barrel having a vertical chamber at the end, the upper portion of which is larger than the lower, and having a valve seat at the junction of the two and below the passage of the faucet barrel, a hollow plug loosely slidahle in the lower portion of the chamber, a valve fixed to the upper end of the plug adapted to close upon the seat or to be raised therefrom to expose openings in the side of the plug below the valve, an inclined surface situated above the chamber, a yoke having its lower ends swiveled to arms connected with the lower projecting end of the plug, and a traveler adapted to move upon the inclined plane whereby the plug is lifted and the valve opened by moving the handle so that the traveler moves up the inclined plane and is closed by gravitation and pressure when the handle is released.

REVERSIBLE OVERLAP DISK HARROW.—Thos. B. Montgomery, assignee to the Benicia Agricultural Works, of Benicia, Cal. No. 525,960. Dated September 11, 1894. This invention relates to improvements in that class of land-tilling implements known as disk harrows, in which a series of saucer-shaped disks is mounted upon shafts carried upon a main frame, so that the edges of the disk act to dig up and cultivate the soil. The concave-convex disks are fixed upon shafts, the journal boxes of which are attached to the beams of the frame, and these beams have a swivel connection between themselves and the main fixed frame, which connections consist of boxes having ball or other shaped chambers, and spindles passing through them with enlargements to fit the chambers, the spindles having the upper ends passing through and adjustably fitted in slotted ends of the maiu frame, and the lower ends extending into the tops of the harrow beams. The two series of disks, heing mounted upon separate shafts journaled from the beams turnable about the vertical axis with relation to the main draft frame, may be adjusted with relation to the linc of travel, and may be reversed so as to present the concave faces inwardly or outwardly, and the heams are also movable so that the disks will overlap and leave no uncultivated space between them.

PAPER CAN.—Geo. H. Bartlett, Tiburon, Cal. No. 525,937. Dated Sept. 11, 1894. The object of this invention is to provide a can with eomplete pasteboard or paper sides and euds, and a means for unitiug them with the smallest amount of metal, and to provide an opening or closiug device whereby the contents of the can may he easily reached or the can hermetically closed. The can comprises an open-ended pasteboard body, pasteboard ends therefor, metallic rings embracing the adjacent portions of the edges of the body and its ends so as to clasp them togetner, one of the ends having an opening and a corresponding ring having a raised inner portion with a cap portiou in a space under said raised portion, and also having a eutaway portion to register with that in the end, so that the parts are firmly connected together while only the pasteboard is exposed to the interior contents of the can, thus preserving them from contact with metal and at the same time enabling the user to open or close the can at will and keep the coutents practically protected from atmospheric influence.

CIRCULATING TUBULAR BOILER.—Edward L. Martin, Kern, Cal., assignor to the Locomotive Feed Water Heater Co., Bakersfield, Cal. No. 525,958. Dated Sept. 11, 1894. This boiler belongs to that class of tubular boilers in which a supplemental heater located in the fire box is connected with the injector from the cold water tank and with the boiler. The improvement consists, in connection with the supplemental heater, of a pipe leading from it above and entering the boiler, the pipe leading from the lower portion of the boiler aud entering the lower portion of the supplemental heater, and the second or auxiliary pipe leading from the lower portion of the boiler and entering the lower portion of the supplemental heater; the objects of the supplementary pipe being, first, to provide for the continuance of the circulation if the main circulating pipe be clogged up, and, second, to provide a means for blowing off the supplemental heater when necessary. For this second purpose the supplemental or auxiliary pipe has a valve in its lower portion.

Octrooi-Aanvrage

Voor Methode om Goud en Zilver van Hunne Oplossingen in Potasch Cyanide Aftescheiden.

Register-Nommer 683.

Ter algemeen naricht wordt hiermede bekend gemaakt dat William David Johnston van beroep scheikundige op den 31sten dag der maand Juli, 1894, en woonachtig te San Francisco, Amerika, te mijnen kantore gedeponeerd eene aanvrage voor een octrooi voor bovengenoemde uitvinding met bijbehoorende beschrijving.

Nademaal nu de gezegde William David Johnston mij schriftelijk heeft kennis gegeven dat bif met deze zijne aanvrage wenscht voort te gaan, heb ik bepaald dat deze aanvrage en alle bezwaren daartegen zullen worden behandeld te mijnen kantore op Vrydag, den 14den dag der maand December, 1894, ten 3 ure 's middags.

Ik roep daarom alle personen op, die er belang bij hebben zich te verzetten tegen het uitreiken van een octrooibrief voor gezegde uitvinding aan gezegden William David Johnston om ten minsten zeven dagen voor genoemden datnm van behandeling te mijnen kantore te deponeeren een geschrift, waarin zij hunne bezwaren ontwikkelen, daar zij anders uitgesloten zullen zijn, die voor te brengen.

Aldus den 2 den dag der maand Augustus, 1894, te Pretoria, Zuid Afrikaansche Republiek.

CARL UEKERMANN, Sr.,
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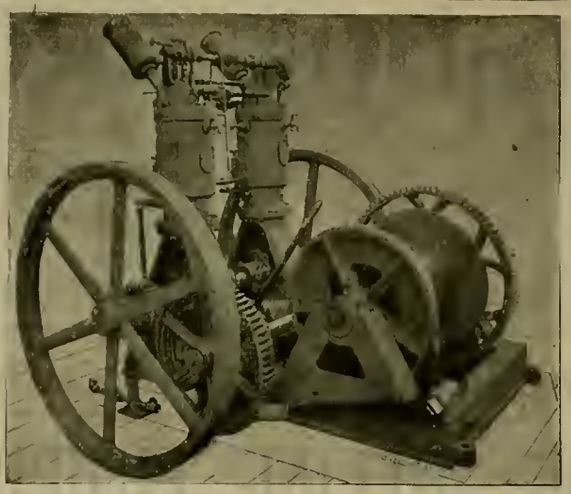

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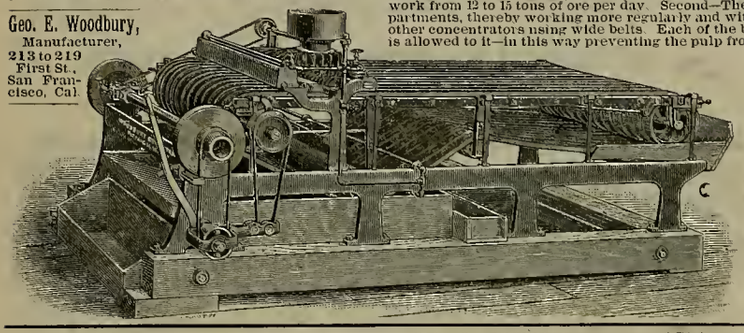

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VOLUME LXIX. Number 15. SAN FRANCISCO, SATURDAY, OCTOBER 13, 1894. THREE DOLLARS PER ANNUM Single Copies, Ten Cents.

Largest Air Compressing Plant.

The Nottingham colliery at Plymouth, Pa., is the largest producing coal mine in America. Low steam pressures available at the pumps together with the expense of maintaining a safe roof in the passage ways through which the steam pipe ran, the liability to accident and interference with the ventilating currents in case the steam pipe was broken, together with a number of other objections, induced the management of the company to look for some other method of transmitting power.

The contract was awarded to the Ingersoll-Sergeant Co., and work on the plant was commenced at once and pushed rapidly to completion. It has now been in constant use for several months and fully meets the requirements of the work and the expectations of the officials of the company.

Fig. 1 shows a perspective view of the air compressors, erected near the head of the shaft. There are two pairs of piston inlet duplex compressors with steam cylinders 28 in. x 48 in., and air cylinders 34½ in. x 48 in. It will be noticed that the compressors are set side by side, and that the steam ends are of the Corliss type. The fly-wheels weigh 50,000 pounds each, and they are placed between the duplex cylinders. Under ordinary conditions, but one pair of the compressors is run at one time, the other pair being held for reserve.

The perspective view (Fig. 1) shows the method of connecting the governor to the wrist plates. In case the governor belt should break, the engine is stopped automatically by the device shown in Fig. 2. (See page 228.)

In this arrangement the trip collar has two toes, *A* and *B*, the former regulating the cut off, under ordinary conditions, in the usual manner. In case the governor belt breaks, the balls fall, the trip is pulled to the right, the toe *B* releases the block *D*, by striking one arm *E* of the disengaging link or crab claw, forcing it outward so that the dash pot can operate as if it was cutting off. The toe *B* is so located that the block *D* cannot engage again while the balls are down, because the arm *F* of the crab claw is riding on its back, and will not permit the arm *G* to get near enough to the block to engage with it. This shuts the steam off from both cylinders and the engine will stop as soon as the resistance overcomes the momentum of the moving parts. The toes and the part of the crab claw which they touch, indicated by heavy shading, are all made of hardened steel. The cut off varies from one-third to seven-eighths stroke.

Indicator cards show that with a mean effective steam pressure of fifty-one pounds per square inch, the horse power of each cylinder is 410, or 820 for each pair, making the total indicated horse power of both pairs of engines 1640. The water consumption shows a total of 21.78 pounds per indicated horse power per hour. Taking nine pounds of water evaporated per pound of coal as a fair allowance, we have 2.42 pounds of coal used for each indicated horse power per hour—a very creditable showing.

Fig. 3 shows a longitudinal section, cross-section and rear end view of one of the air cylinders. It will be noticed that the piston is hollow, and in addition to the usually solid piston rod, there is a hollow rod which extends through the back cylinder head. This hollow piston and rod afford means for the admission of free air to the cylinder. The method of accomplishing this is an extremely ingenious application of Newton's first law of motion. *H* and *I* are large metallic rings, shaped as shown in the longitudinal section. These rings have oblong

(*Continued on page 228.*)

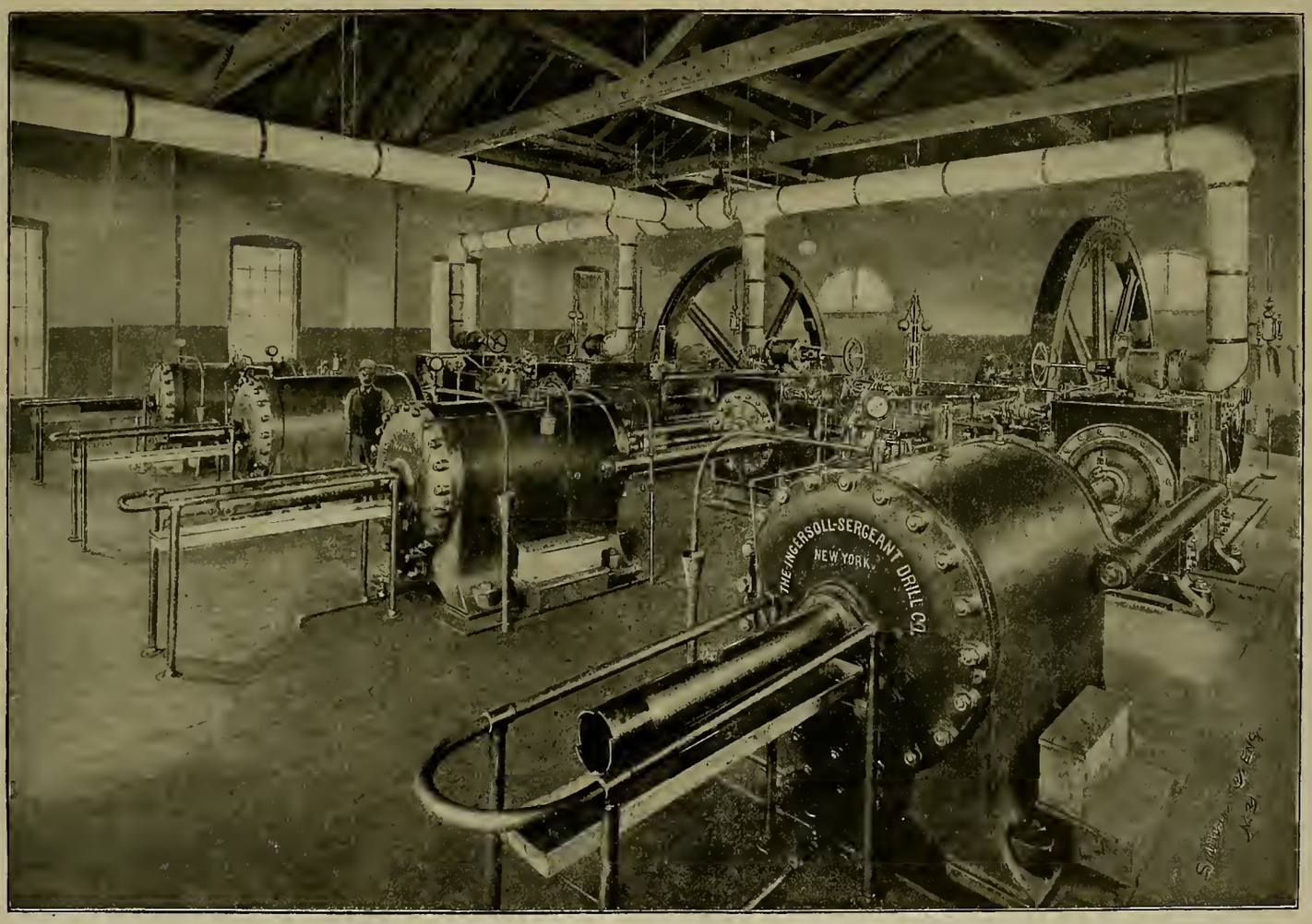

FIG. 1.—PERSPECTIVE VIEW OF INGERSOLL-SERGEANT AIR COMPRESSORS AT NOTTINGHAM COLLIERY.

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San Francisco, October 13, 1894.

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Advertising the Mining Industry.

The supervisors of Nevada county have made an appropriation to establish and maintain at the State Board of Trade Rooms in San Francisco, a permaneut exhibit of the product of their mines. This is a move in the right direction. The Board of Trade rooms are daily visited by hundreds of people in search of information about California's resources. Thus far the exhibits have been almost entirely of an agricultural character. The mines and manufactures have been ignored or neglected. If Nevada county thus calls attention to her mining interests, other counties will feel called upon to do the same.

The raisin, orange, prune, nut, wine and other industries make extensive permanent displays at the State Board of Trade, yet their combined annual product by no means reaches that of the mining industry, which is not represented at all; in fact, our miuers do not take half the trouble they should in advertising their interests. They keep too much to themselves, unless they have a mine to sell. Very few will ever take the trouble, for instance, to write letters to the PRESS (which is always glad to publish them) concerning the progress of their camps. People looking for investments in miuiug properties have to find out as best they can where to look, for the miners give very little help, indeed.

The State Mining Bureau has a magnificent collection of ores and minerals at its museum in the Pioneer building on Fourth street, but this has been collected piece by piece from individuals. The counties, as a body, have never made any special efforts to provide complete collections of their own mineral products. This they should, however, do, something after the manner it was done at the Midwinter Fair. The Mining Bureau is really the place where the most complete displays should be made, and these could be supplemented by smaller exhibits at the State Board of Trade, with printed reference to the more extensive ones at the Bureau.

Thousands of people who come to this State looking for fields of investment would be attracted to the miuing regions were the resources of those sections properly advertised. The wine, raisin, orange and fruit men keep advertising persistently, and many investments are made in those directions. The miners, however, seldom take the trouble to tell anybody publicly what they are doing, how much they are makiug, or what they have for sale. It is time for the miniug community to wake up out of its "'49" sleep and let people know that it is awake and ready for busiuess.

State Debris Commissioner.

John F. Kidder, the State Debris Commissioner, has filed his report with Governor Markham. The storage capacity of dams already constructed is 21,336,723 cubic yards of impounding reservoir. The Board had sixteen meetings, at the majority of which he has been present, aud he has also visited in company with the United States Engineers a majority of the mines applyiug, some of them being of such a nature as to not necessitate his visiting them.

He thinks that the aid of the Government should be extended to build restraining dams, and begs the Governor to urge the Uuited States to make an appropriation with the $250,000 conditionally appropriated by the State. He also recommends that the Debris Commissioner of California be made a member of the United States Commission and have a vote therein. The Federal Commissioners are in accord with him in that plan. The most cordial relations exist betweeu him and them.

In order to carry out Mr. Kidder's recommendation some Congressional action will be necessary, since uuder present laws he cannot well be made a member of the United States Commissiou. It will be remembered that Mr. Kidder is holding his office under a law which the State makes an appropriation for debris dams only under condition that the United States Government does the same thing. The Government has not done this, so that thus far Mr. Kidder has been working without any money to work with, or even any salary.

It is really going to be a somewhat difficult matter to get Congress to appropriate $250,000 to match the State's conditional appropriation for debris dams in the rivers. Congress would not do this unless the request were backed up by the recommendation of the members of the U. S. Engineer Corps, U. S. A., who now form the Californuia Debris Commission, and this recommendation, it may be confessed, will hardly be made. It is generally understood that the members of the California Debris Commission are averse to any Government appropriation for this purpose, being of the opinion that the present system of each mine paying for its own restrainiug works is preferable and proper.

This being the case, it does not look as if the State appropriation would ever be available. If the miners appeal to Congress for an appropriation, the opiuion of the engineers will be asked before it is made, and if they, through the War Department, report adversely, then Congress will do nothing.

It is just as well to recognize this fact first as last. There is little real use in passing a lot of resolutions and petitioning Congress to do something which there is little or no hope of its doing. It is a fact that this measure of relief must meet the approbation of the local engineers or it will be no further considered. It may be that these gentlemen have not, as a body, come to any decision on the subject; in fact it has not yet come before them in an official way. But it is understood that, as individuals, they see no reasou for Congress to appropriate moneys for the purpose specified. It is possible, however, that they might be brought to see the need of two or three dams at certain points to keep back debris already in the rivers and now slowly moving down, since in their original report they referred to the desirability of such dams. Congress can never be made to set aside money for any dams behind which any mines may deposit their debris, since if it does anything at all it will be for the benefit of the rivers and not for the benefit of the miners. The individual dams will still have to be built in any event.

This matter will doubtless come up before the Miners' Convention, and those who expect to be delegates should give it consideration at this time, so as to be prepared to discuss it thoroughly.

California Platinum.

That rare and expensive metal platinum is found in several places in northern California and southern Oregon, but nowhere else in the United States, and it seems strange that so little effort is made by the miners to save it. It is found in many of the hydraulic mines in Sierra, Plumas, Trinity and Siskiyou counties, in company with the gold; but the whole product of this country is not over one or two hundred ounces per annum. In cleaning up the sluices from these hydraulic mines the platiuum settles with the gold, amalgam and black sand, but it is generally thrown away with the latter.

It is not a very difficult operation to separate the platinum from the concentrated black sands, but very few of the miners pay any attention to its presence. Perhaps this is due to its comparatively small quantity or a mistaken idea as to its value. At all events, there is a very small amount obtained, though its presence is known in many places. In the gold washiugs of Russia, every care is taken to collect this substance, and the world's supply is obtaiued from there.

It would pay our miners who are working gravel claims where platinum is found to take the proper steps to save their black sands and treat them for this substance. It is in great demand and very expensive, beiug altogether too valuable to be allowed to go to waste, as is doue geuerally at present.

Old Quartz Mines.

A very encouraging feature of the present gold mining outlook in this State is the rehabilitation of old quartz mines which were partly opened and then abandoned twenty years or more ago, when the conditions surrounding mining operatious were very different from what they are now. At that time we had very extravagaut ideas as to the profits of quartz mining and the methods of conducting it. Small economies were not practiced or even thought of. Superintendents, with little to do, were paid exorbitant salaries, and the whole system was "top-heavy" with useless supernumeraries in the way of salaried officials. Moreover, machinery and all sorts of supplies were very expensive, and means of transportation inadequate and costly. It took more than twice as much to equip a mine as it does now, and about three times as much to work the ores. In consequence of these conditions numerous mines were opened and outfitted which could not possibly pay under such circumstances and they were finally abandoned.

In these days of economy in administration, cheapness of operation and low cost of transportation of ores, these old mines will pay well, as experience is proving every day. The most noticeable instances are those of the three largest gold producers in the State, the Utica at Angels, Calavaras county, the Kennedy at Jackson, Amador county, and the North Star at Grass Valley, Nevada county. All of these mines were idle for years after having been worked for a time. When they were finally taken hold of by men of means and experience, who put capital into them for proper development and equipment, and managed them on a business basis, they at once began to pay handsomely.

These examples—a few of the many which might be cited—should be sufficient to show what can be done with these old mines. A good many men are looking them up in California in these days, hunting up their records and considering the advisability of reopening and equipping them. Numbers of such claims are in the hands of men without money, and will be useless as long as they remain so; but when capital is interested the mines can be made to pay well.

Sulphur.

Large quantities of sulphur are consumed in this State for sulphuring vines, manufacturing sulphuric acid, refining petroleum, fertilizers, etc., but none is produced here. There are, however, several known deposits, but they are not worked. Formerly considerable quantities were obtained at the Sulphur Banks in Lake county, but it is not now mined there. There are extensive deposits in Kern county but they have never been utilized. In fact, there is now no sulphur miued in the United States except at Black Rock, Utah, where the Utah Sulphur Co., formerly the Dickert & Myer Sulphur Co., is operating.

Those mines produced last year 1200 short tons valued at $42,000—spot value. In 1892 the product of the same mines was 2688 short tons, valued at $80,640. In 1889 the Banner mine, near Frisco, Utah, and the Wise mine, at Winnemucca, Nev., both produced some sulphur. The output of that year was 1150 tons sulphur ore, yielding 450 tons refined sulphur.

All the sulphur used on the Pacific coast comes

from Japan, and it is so cheap and of such good quality that our own produce cannot compete with it, coming as it does by the shipload. Last year we imported at San Francisco from Japan 7766 tons crude sulphur valued here at $125,507; the previous year a little less only; and in 1890, 8819 tons valued at $115,637. The figures for 1891 were 7256 tons crude, valued at $127,797. The Eastern States get all their sulphur from Sicily. The Italian (or Sicilian) imports to this country for three years were: 1891, 101,660 long tons, value $2,140,516; 1892, 90,668 long tons, value $2,147,942; and 1893, 103,146 tons, value $958,303.

The Japanese sulphur is landed in San Francisco for a less price than the freight alone would be from Utah to California, and our own deposits in Kern, Lake and other counties could not possibly pay to be worked under present conditions. This Japanese sulphur, though called "crude," is very pure in quality, running up to 98 and 99 per cent. Even the second grade is 96 and 97. The dealers who sell it as "sublimed" sulphur merely grind it finer, and do no refining whatever. It has driven the French refined or sublimed entirely out of the market, except, perhaps, a very little for chemical laboratory purposes. In Japan they have immense quantities which may be obtained and shipped at very low figures. Neither the Nevada nor California deposits can compete with these abundant supplies. About all that is imported at San Francisco is used on this coast, so the imports stated above indicate the amount of coast consumption.

The Miners' Convention.

The annual convention of the California Miners' Association will take place in this city on the 19th of next month, having been postponed by the executive committee of the association so that it would occur after the elections, in order that politics should cut no figure in the deliberations.

The different branch county miners' associations should see to it that they are well represented at the convention and that only those are chosen as delegates who will attend. It is of the utmost importance to the mining industry of this State that the miners stand shoulder to shoulder and united in their common cause. By this means they may accomplish whatever is needed to advance their interests. If they relax their efforts or fail to realize the advantages of unity of action, they have only themselves to blame should legislation adverse to their interests be enacted.

It is not by any means hydraulic mining alone which needs protection. That interest is now getting on very well indeed. The quartz and drift mines are both laboring under burdens imposed upon them by foolish laws and absurd Department rulings.

The attention of Congress must be forcibly called to the miners' needs. If this is properly done there will be no difficulty in obtaining the necessary relief. But the demand must come from the miners as a body rather than from Representatives in Congress, in order to be properly received and acted upon. At the coming convention several pending measures will be studied up and criticized and it will be well for all the counties to be well represented.

The following circular has been sent out by the executive committee of the State Association:

CALIFORNIA MINERS' ASSOCIATION,
Headquarters—Room 2, ninth floor, Mills Building,
SAN FRANCISCO, October 4, 1894.

To the Miners' Association of ——— County—GENTLEMEN:—At a meeting of the general executive committee of the California Miners' Association, held on Monday, September 10th, it was decided by a unanimous vote to postpone the annual convention of the association from October 8, 1894 (the time it is usually held), to the third Monday (19th) in November.

At that time the elections will have been held and our Congressmen chosen, and we can ask them to meet with us in the convention and express their views regarding national legislation on questions affecting the mining industries.

The platforms of both the Republican and Democratic parties in this State declare in favor of the rehabilitation of the hydraulic mining industry, showing that the popular voice seconds our efforts in this direction.

The daily press of San Francisco, and many of the papers of the interior, have spoken plainly of the necessity of proper legislation regarding the proving of mineral lands before the Land Office, and it is evident that the time is ripe for a reform of the abuses which now exist.

The Newlands mining bill, now pending in Congress, should receive the attention of all quartz and drift-gravel miners, who should support it and urge its passage in every way, and do all in their power to defeat the Stewart mining bill, also pending.

Not only the cities, but the farming communities, look to the gold miners of the State for help to tide over the existing depression in business affairs.

This will be the golden opportunity for the miners of California to show by their numerical strength at the next convention their importance as factors in the industrial advancement of the State, and to urge the necessity of proper national and State legislation to aid an industry the product of which adds such substantial wealth to our country, and gives employment to so many men, and which by suitable encouragement may become still more important and productive.

EXECUTIVE COMMITTEE CALIFORNIA MINERS' ASSOCIATION,
Per W. C. RALSTON, Secretary.

DRILLING CONTESTS seem to be getting fashionable among the miners. We hear of them in all the mining States and Territories of late, and there is evidently a very spirited rivalry among local teams in all the places. These contests are good for the men and good for the employers as well, since after a man has once established a reputation as a rapid driller he will have to "keep up his lick" in everyday work as well as at exhibitions. Superior skill should bring an increase of wages also, but this does not seem to be taken into consideration as much as it should.

Concentrates.

THE New London mine, Amador Co., is being equipped with a new hoist.

THERE are about 500 men now prospecting and working at Kennedy, Nev.

THE specie shipments from San Francisco during September aggregated $2,439,431.

THE Bodie mine cleared up after a crushing 581 tons in 29 days and obtained from the whole run $73,173 in gold.

THE drillers who took part in the Admission Day contest at Sutter Creek have decided to have a "redrilling" on October 20th.

VOORHEIS & BARNEY'S sulphurets works at Jackson, Amador county, have closed down for a while, as they have no more ore on hand.

FIVE THOUSAND DOLLARS in gold was shipped from Silver City, N. M., last week, much of which came from the mines at Piuos Altos.

THE Dunderburg mine, near Bridgeport, has been bonded by a San Francisco company, which will soon commence work under the conditions of the bond.

THE San Francisco Mint coined $1,919,500 in gold in September. The gold coinage at the local mint for the year up to Sept. 30th has been $15,304,500.

THE working force at the Champion mine, Nevada City, is being gradually increased and in a little time as many men will be employed there as before the late injunction was served.

A LOT of ore buyers met at Spokane, Wash., the other day to bid on $100,000 worth of ore from the Slocan Star mine in Slocan district. The Omaha and Grant smelter captured the contract.

WOLF CREEK, OREGON, seems to be doing well this year. Sales are being made and all ground and ledges that are worked properly are yielding good results to their owners and operators.

NEGOTIATIONS are in progress for the erection of a smelter to treat the ores of Trail Creek district, Wash. O. Bergstrom, assayer for the Colorado smelter at Butte, is working up the project.

J. D. TOMLINSON, the purchaser of the Jennings mines on the Hassayampa, A. T., has torn down the Red Buck mill at Walnut Grove and is preparing to move the same at once to its new location.

THE company owning the Lucille, at Plymouth, Amador county, have got control of the old Hendy mine at Nashville, just across the river in El Dorado county, and have a force of about twenty men at work there.

THE Resources Consolidated quartz claims, near Sweetland, Nevada Co., have been sold by the owners, Hon. R. I. Thomas and others, to W. H. Aubury of New Mexico and Hon. M. J. Farrell, formerly of Grass Valley.

W. M. HANNUM has sold 80 acres of placer ground in Grave Creek district, Oregon, to A. A. Davis and Mr. King of Medford, who will lay a 15-inch pipe and be ready for active operations by the time the fall rains set in.

THIS promises to be a winter of peace, industry and prosperity at Cripple Creek. Preparations have been made for steady work, and the monthly output of the mines there will increase right along despite snow and cold.

THE Gutheridge & Thornburg placer ground on the north fork of the John Day river, Oregon, has been sold for $15,000 to Utah men—C. E. Jennings of Salt Lake, and B. S. Kimball, L. P. Kimball and F. R. Davis of Park City.

J. H. READER has leased his Shady Creek mine, Nevada county, to A. B. Driesbach & Co. of Penn Valley, for five years, for $2,500. The mine is a creek bed placer claim, and was worked as far back as 1861 and 1862. It paid well in those days.

AN assayer who thoroughly understands the situation thus defines a "strike" as applied to mining properties: "What I call a strike is when the owner or lessee of a mine takes out the ore, ships it and gets the money in his pocket. That is a strike and one that counts."

THE Standard Consolidated Company, of Bodie, have begun the erection of a big dam across Green Creek above the dynamo. The dam will be from thirty-five to fifty feet high. Four-fifths of a mile of pipe will be laid. Every available man in Bridgeport has been engaged for the work.

THE T. H. Steel & Company mine, situated near Brownsville, Yuba county, has received a permit from the California Debris Commission to begin operations. The Commission will view the workings of the mine when ready to start, and can then decide if it is operating according to law.

THE Horn Silver Mining Company of Utah has elected the following officers: Allan C. Washington (President), Juan M. Ceballos (Vice-President), P. T. Farnsworth, Bache McE. Whitlock, Theodore B. Moore, John Sharp and Frank W. Jennings. Ambrose L. Harrison is Secretary and Treasurer.

THE sale of the Red Chief group of mines at Cable Cove, Oregon, has been consummated, Messrs. Frank E. Plummer and Chas. Cupernell, of Des Moines, Iowa, being the parties purchasing the properties. The parties selling were Major F. T. Glisan, J. B. Taylor, E. L. Giroux, Richardson and others.

BOULDER DISTRICT is a new one, about ten miles southeast of Silver City, Idaho. About thirty men are now employed in the district developing claims which are showing up very satisfactorily. The district covers a considerable extent of territory. The ledges are large and the most of them are gold producers.

ONE HUNDRED AND SIXTY-FIVE THOUSAND DOLLARS in dividends is the record of the Centennial-Eureka Mining Company of Utah, during the past year ? general mining depression. The ore sales aggregated over a quarter of a million and the treasurer now has a surplus of $77,924. This was the showing made at the annual meeting of the stockholders.

THE wages paid on the Randt last year for labor were to whites £1,252,491; to the natives £1,100,855; total, £2,353,346, and yet there are some people who are continually groaning and mouning about the crimes and misdemeanors of the white man in Africa. Why, before he discovered this gold field the Randt was itself a howling wilderness, and certainly no wages were paid.

A CORRESPONDENT has the following to say to those intending to go to the camp at Kennedy, Nev., for the winter: "Stay where you are, for we have plenty of working men here at present, but in the spring when capital erects more mills and smelters, which will be done, then Kennedy will extend and give labor to hundreds of people. Then we will welcome the laboring man."

A STATEMENT made by Southern Oregon papers that the Mollie Hill, one of the big mines of Reuben creek section, had been purchased by Jacob Kamm, of Portland, and that he is putting up a stamp mill there, was, it appears, premature. Mr. Kamm says he was negotiating for the purchase of the mine, but, as there was some doubt in regard to the title, the sale was not made.

THE White Swan mine, Baker City, Oregon, has been purchased by Mr. G. S. Tarbell, the original discoverer of the mine and who realized several thousand dollars in dividends from the property while it was operated by the White Swan Company. It is expected that it will take from twenty to thirty days to clear the mine of water, when a full payroll will be put on and the mine operated to its full capacity.

PLACER mining along the Columbia river is receiving an impetus that promises to develop into settled mining operations. The scene of the present excitement is at Troy, twenty miles north of Wenatchee. The high water in June washed off many bars where Chinamen have been known to mine years ago. The ground is found to be very rich. New camps are being made every day along the river, and that section promises new developments right along.

MESSRS. O. H. JONES and John Dibort are in from the Old Glory camp. The former is going to his ranch at the Oracle, and the latter is doing duty as a juryman. They report the "Old Glory" as a prosperous camp. The machinery will soon be in place and in readiness to move within a week or two. The mine looks splendid and the ore in sight of vast proportions. Everything about the camp is done in a first-class manner, denoting permanency.—Tucson Citizen.

TRINIDAD (Colo.) people are greatly excited over the recent gold finds in Costilla valley, just west of Trinidad, at the camp called La Belle. A town site has been located and about 300 prospectors are taking up and working claims. The ore is easily mined and yields from $8 to $500 per ton. The camp is 30 miles from the end of the Catskill branch of the Gulf road, and 50 miles to the Denver & Rio Grande in the San Louis valley.

THE idea has gone forth that the mines about Mineral Park, Stockton Hill, Cerbat and Chloride have been dug out, and the district has received derogatory mention at the hands of parties who know little or nothing that constitutes the signs of promising prospects. Some few sturdy miners have stood by their properties and have steadily worked ahead, while from time to time new discoveries have been made. At the present time no district in the county can make a better showing, and the recent "strikes" made are astonishingly rich.—Mojave Miner (A. T.)

A MILE above where the Bruneau enters the Snake river an immense dam has been constructed and work is being prosecuted on a great canal, which will turn the water on to the Snake river plains below and reclaim about 25,000 acres of rich land now arid. The water from the canal will also be employed to work thousands of acres of rich placer grounds along Snake river. The completion of this canal, the settling up of these rich lands and the working of the placers, known to be rich, will add greatly to the material prosperity of Owyhee county, Idaho.

THE Marysville *Democrat* says: Thomas Casey, Councilman Kelly and Mark Eckart, who recently returned from Eureka and Bowman's Dam, Nevada county, tell of a valuable quartz lode recently developed at the south side of the dam. The lode is claimed by Gen. A. M. Dobbie, resident agent of the North Bloomfield Company, who has resided at the dam during the past two summers. He calls it the Jeffersonian mine and intends erecting a mill next season, operating it with power furnished by electricity. There is plenty of water power and all the pressure necessary to furnish any quantity of electricity, within a few yards of the mine.

Personal.

SAM CURTIS, the well-known Comstock superintendent, has been examining some of the mining properties near Sutter Creek, Amador Co.

P. DEIDESHEIMER has been up at Sierra City, negotiating the sale of the Oxford mining property.

MR. W. C. RALSTON, secretary of the California Miners' Association, has gone to Baker City, Oregon.

MR. W. L. WATTS, field assistant of the State Mining Bureau, has gone to Los Angeles to study up the oil fields there and on adjacent areas.

Largest Air Compressing Plant.

(Continued from page 225.)

holes in them through which small bolts pass. The duty of these bolts is to keep the rings from moving outward too far.

When the piston starts on its forward stroke to the left, in the direction of the arrows, the rings, not being a part of the piston, tend to keep the position they were in when the piston started. As a result the ring *I* is forced to its seat and the ring *H* from its seat by the forward motion of the piston. When the piston reverses at the end of its stroke the tendency of the rings is to keep up their motion to the left, but the piston, moving to the right, forces the ring *H* to its seat, and *I* away from its seat. The two rings form the inlet valves. If the piston is moved to the left the ring *H* will be in the position indicated. The advancing piston leaves a partial vacuum behind it, and the free air rushes in through the hollow rod and piston into the cylinder, following the direction of the arrows. When the piston movement is reversed, the same thing takes place except that the free air enters the cylinder through the ring *I* instead of *H*. As air has weight, it possesses the property of inertia common to all ponderous substances, and therefore when started in the direction of the arrows, its own inertia keeps it moving in the same direction while the valve *H* is closing and *I* opening. This causes a continuous current of air to flow in *one* direction instead of two (right and left alternately).

The compressed air is conveyed into the receiver at one end, and is conducted from the opposite end through a fourteen-inch pipe to an air shaft 800 feet distant, down which it is conveyed 200 feet to the underground workings. The course of the pipe is clearly shown on the plan designated Fig. 4, which is drawn to a scale of 600 feet per inch. From the foot of the air shaft, the pipe line exteuds nearly straight ahead about 1450 feet to a point where it is divided into two lines.

The descriptive matter is from the *Colliery Engineer*. For the illustrations we are indebted to the Parke & Lacy Co., who are the agents on this coast for the Ingersoll-Sergeant Co.

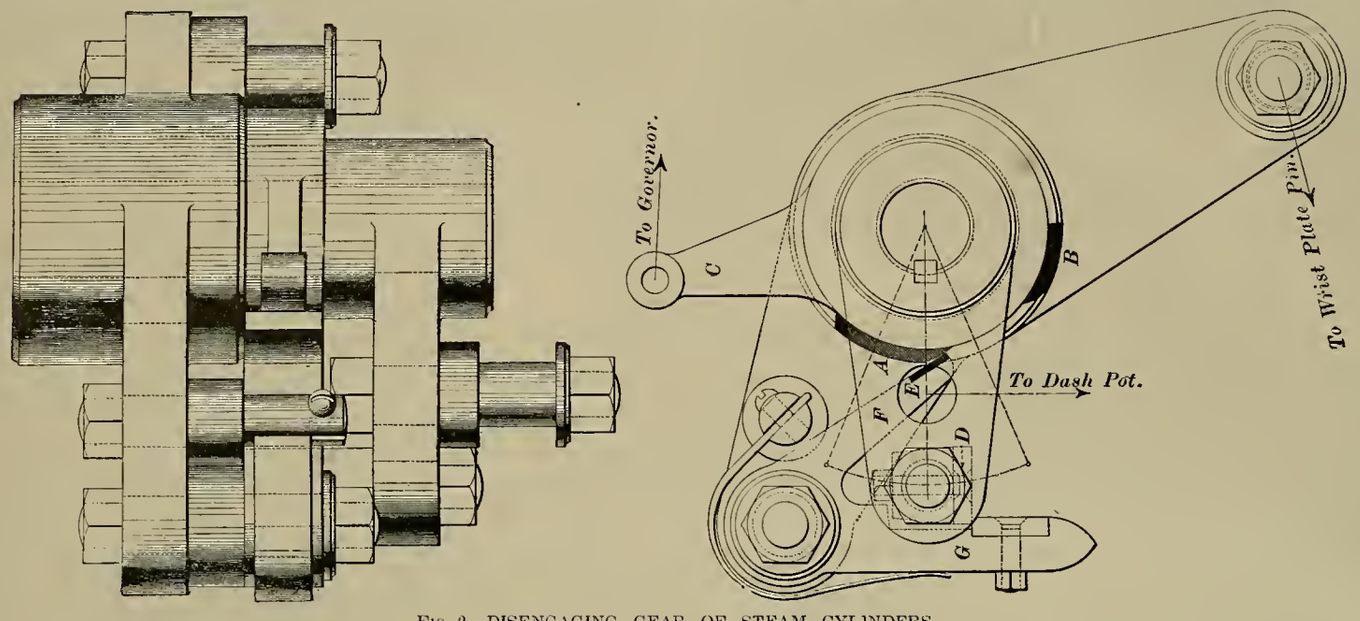

FIG. 2.—DISENGAGING GEAR OF STEAM CYLINDERS.

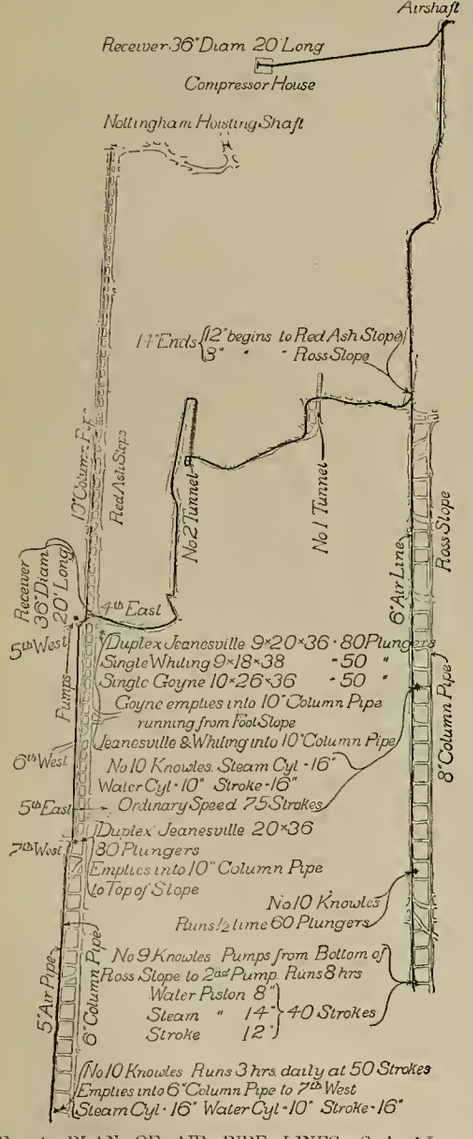
Airshaft
Receiver 36" Diam 20' Long
Compressor House
Nottingham Hoisting Shaft
14" Ends 12" begins to Red Ash Slope
8" " Ross Slope
10" Column Pipe
Red Ash Slope
No 2 Tunnel
No 1 Tunnel
Ross Slope
6" Air Line
8" Column Pipe
Receiver 36" Diam 20' Long
4th East
5th West
Duplex Jeanesville 9×20×36 · 80 Plungers
Single Whiting 9×18×38 · 50 "
Single Coyne 10×26×36 · 50 "
Coyne empties into 10" Column Pipe running from Foot Slope
Jeanesville & Whiting into 10" Column Pipe
Pumps
6th West
No 10 Knowles Steam Cyl · 16" Water Cyl · 10" Stroke · 16"
5th East
Ordinary Speed 75 Strokes
Duplex Jeanesville 20×36
7th West
30 Plungers
Empties into 10" Column Pipe to Top of Slope
No 10 Knowles Runs ½ time 60 Plungers
No 9 Knowles Pumps from Bottom of Ross Slope to 2nd Pump. Runs 8 hrs
Water Piston 8"
Steam " 14" } 40 Strokes
Stroke 12"
5" Air Pipe
6" Column Pipe
No 10 Knowles Runs 3 hrs daily at 50 Strokes
Empties into 6" Column Pipe to 7th West
Steam Cyl · 16" Water Cyl · 10" Stroke · 16"

FIG. 4.—PLAN OF AIR PIPE LINES. Scale: 1 In. = 600 Ft.

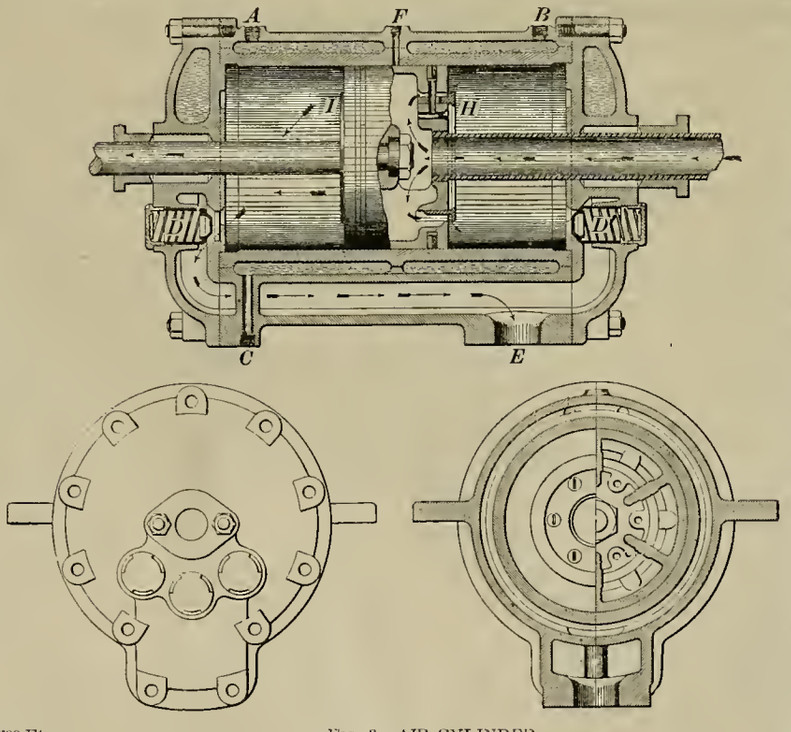

FIG. 3.—AIR CYLINDER.

"MY SON, observe the postage stamp. Its usefulness depends upon its ability to stick to one thing until it gets there."—Boston Evening Gazette.

The Uses of Aluminum.

The uses to which aluminum has so far been put in the arts may be divided into two general classes; one for the fabrication into articles generally classed as "fancy goods," and the other for more staple articles.

The selling price of aluminum was so high (above $16 per pound) up to the first of the '80s, that the metal received very few uses except for expensive philosophical instruments and other such purposes, where the weight of metal used was trifling and the work upon it of very much larger value than the amount of aluminum used.

The cheapening of the process of manufacture of metallic sodium (by the aid of which all the aluminum produced on a commercial scale up to the year 1888 was made), gradually lowered the price of aluminum, until it was selling in 1886 at about $8 per pound. The works of the Societe d'Anouyme d'Aluminium at Salindres, France, which produced the largest amount of pure aluminum, had by that time been enlarged and systematized to such a meritorious extent as to make a very profitable business for the owners.

The use of aluminum in the arts was further encouraged in the years 1887 and 1888 by the investment of large capital in the sodium process of manufacture of the metal by the Alliance Aluminium Co., at Newcastle-on-Tyne, and the Aluminium Company, Limited, at Oldbury, near Birmingham, both in England.

Unfortunately for these concerns, as well as for the older French manufacturers, the new electrolytic method of manufacture of aluminum soon eclipsed the older method of manufacture by the use of metallic sodium as a reducing agent, and aluminum was sold in the latter part of the year 1888 and the first of the year 1889 at the rate of one pound sterling per pound avoirdupois, although the first metal sold by the Pittsburg Reduction Company in 1888 was sold at the rate of $8 per pound. In 1889 the rate for aluminum was further reduced to $4 per pound, and new uses for the metal were brought out, to replace brass, German silver and nickel work in fancy goods articles.

The Scovill Manufacturing Company of Waterbury, Conn., was one of the first and largest concerns to undertake this new development of the use of aluminum. They are to-day one of the largest and most important concerns in this country in the production of stamped and spun articles made from aluminum.

The uses of aluminum up to 1890 were almost altogether confined to what might be classed as strictly fancy goods articles made of the metal. With the

lowered rates of $2 per pound, and later $1.50 per pound, during 1890 and 1891, very considerable uses for aluminum begun to be found.

As the lowered selling price of aluminum had thus far been almost entirely put forward by American manufacturers of the metal, so also the first development of the use of aluminum in the more practical and staple articles was in America; but soon, the foreign manufacturers, keeping pace with the lowered selling prices of aluminum in America, became very much interested in the use of the metal. However, with the middle of the year 1890 and the first of the year 1891, may be fairly attributed the start of the staple uses of aluminum in the arts. By the middle of the year 1891 and the first of the year 1892, the German government became interested in the use of aluminum for military equipments, and the large continental steel works begun to adopt the systematic use of aluminum for increasing the soundness of their steel when cast into ingots or castings. It may be fairly admitted that within the past two years the Germans have outstripped the Americans in the adoption and use of aluminum for staple articles. They have, as well, commenced to manufacture almost countless articles of fancy goods of aluminum. The American public was first apprised of this in a large way at the time of the World's Fair, when there was a considerable exhibit of German articles of aluminum. In this country, the progress of the more staple uses of the metal has been slower than in Europe, but progress is now being made in this direction quite rapidly. Most of the large steel works of the country have adopted the regular use of aluminum in the manufacture of steel, and companies making steel castings are almost universally using it in considerable amounts in their manufacture of these castings.

The Army and Navy Departments of the Government of the United States have not been as rapid in their adoption of the use of aluminum for military and naval equipments as abroad, and yet considerable progress has already been made, and more rapid progress can be looked forward to in the near future. Already considerable orders have been received from the various Government departments by the aluminum manufacturers; and with the recent advent upon the market of hardened "nickel-aluminum" alloys (which show a tensile strength in casting of 25,000 to 30,000 pounds per square inch, and in rolled bars and plates of 45,000 to 50,000 pounds per square inch), many added uses for the metal are being adopted.

The next two years will undoubtedly show a more rapid development of the more staple uses of aluminum in the arts in the United States than the whole progress so far made.—Mr. Alfred E. Hunt, in The Aluminum World.

Boy Stomach Power.

A boy eats two ounces of ice. Let us see, says the *Engineer*, what is the approximately thermodynamic equivalent of the work he has made his interior do, assuming he takes five minutes to eat it. In melting the ice, taking the latent heat of fusion at 143 units, and the specific heat the same for the coloring and sweeting admixture as for the ice, he will require eighteen units to reduce the ice to water. To raise it in temperature to that of his inside, he will require seven more units, or a total of twenty-five British thermal units. Taking the mechanical equivalent as 777 foot-pounds, this will be equal to 19,425 foot-pounds. If the by weighs 100 pounds, he will have called upon his stomach to do as much heat work as would, with a machine having unit efficiency, raise him 194 feet high, or a rate of heat extraction equal to nearly an eighth of a horse power.

DEPARTMENT OFFICIALS of the Ordnance Bureau are giving attention to the possibilities of aluminum. This metal promises to be one of the most important materials in the equipment of modern arms. Already the German armies, which are among the first to accept improvements, have adopted aluminum for a variety of uses, while the War Department is in a measure following the lead of the uavy in giviug attention to the new metal. It is in the liue of small equipments that the army is expected to utilize the metal. Samples are in the Ordnance Bureau of aluminum cups, belt buckles, hooks and horseshoes.

The lessening of marching weight is one of the problems which always is before the officers who superintend the matter of equipments. It is hoped that in the near future it will be found practicable to use the light metal, not only for drinking cups and dishes of the soldiers, but for bayonet scabbards and other accoutrements in which strength is not the first requisite.

THE New York *Electric Review* asks that this be believed: When Edward Smith was passing in frout of the headquarters of the N. Y. and N. J. Telephone Company in Smith street, Brooklyn, N. Y., last Saturday night, he was stopped by some boys, who asked him to throw a bent wire over the electric light wire, none of them, as they explained, being able to perform the feat. He took the hooked wire in his hand, and at the first trial threw the end over the electric light wire. Then an ambulance took him away to be revived. Edward is now suspicious of all small boys and anything wiry or electrical.

The Genesis of Gold Placers.

NUMBER I.

Written for the MINING AND SCIENTIFIC PRESS by R. L. Dunn, M. E.

Gold placers may be delined as deposits in which the occurrence and distrihution of the gold is the resultant of mechanical forces acting on the gold in its solid form, as distinguished from lode deposits in which the occurrence and distribution of the gold is due to the uction of chemical forces on the gold in either of its other states—liquid or gaseous. So far as our knowledge goes, placers are secondary to lode deposits—that is, formed subsequent to and from them.

The mechanical forces which make placers from the lodes find their resultant expression in the denudation and erosion of the surface of the earth. In operation they are both sub-acrial and sub-aqueous, that is, denudation and crosion occur both ou the land surface under the atmosphere and on the surface under the water of the ocean. The gold placers as commonly understood are exclusively sub-acrial in origin. The exceptions are the auriferous sea beaches and the auriferous conglomerates. The gold in the first of these is readily traceable back to lode sources, from which it is broken out in the progress of sub-acrial crosion. Concerning the conglomerates, which have only recently become important as the source of gold, little is delinitely known. The conclusions of investigators differ materially. By some it is advanced, that so far as the presence of the gold is concerned, the couglomerate is a primary matrix eomparable directly with a lode; that it receives the gold directly by sublimation from the earth's interior. This theory has been made the explanation of the auriferous character of the great Transvaal conglomerate reefs, the greatest gold producers the world has ever known. Another theory is that the conglomerates are formed by the direct ocean erosion of auriferous lodes and their enclosing rocks. In the writer's opinion, however, all of the conglomerates containing gold were once sub-aerial uuconsolidated formations, sometimes, but not essentially always, subjected to sub-aqueous denudation and erosion before becoming cousolidated. That is to say, they were once placers mechanically formed by sub-aerial erosion, secondary and not primary depositaries of gold.

If auriferous lodes be examined the gold will be found disseminated through a matrix or gangue of rock, which is almost invariably quartz. It will be noted that by far the larger number of gold bearing lodes contain the gold in miuute graius, which are more often than otherwise so small as to be invisible to the unassisted eye. Also, that in lodes in which larger pieces of gold occur, the bulk of the gold is still in fine grains, a lode containing only coarse gold being a notable exception. On the other hand, in the aggregate of the gold obtained from placers there is probably more coarse gold than fiue. Placers from which coarse gold only is obtained are commou. So marked frequently is this predominance of the coarse gold from the placers, contrasted with its subordinate occurrence in the lodes of the same locality, that the placer gold would necessarily seem to have come from some other source than the lodes, or if from the lodes, that the eroded portions forming the placers must have been much richer in coarse gold thau the portions in place. Neither of these suppositions is, however, the explanation of the apparantly coutradictory phenomena. The fact is, that the relative magnitudes of the eroded and uneroded portions of the lodes is not appreciated. At the best mining explorations only take in a limited volume of the lode in place, and the possible volume of the eroded portion is not surmised by the miner. This eroded volume is, however, of euormous exteut compared with the volume actually mined in place and in it there is ample space for the occurrence of coarse gold in no greater amount than found in the lode mining to cumulate all the mass found in the placers. At the same time the fine gold from the euormous volume of eroded lode, in aggregate weight several times that of the coarse recovered from the placers, is transported to greater distances, distributed over wider areas and into a many times larger volume of earths and stones than the coarse. Much of it is in ground that a miner would not work, and a still larger portion in deposits in which its existence is not even suspected. It is this disappearing fine gold which is frequently respousible for the incorrect opinions as to the source of the coarse gold.

The sub-aerial agencies of denudation and erosion are temperature, water and the atmosphere, acting individually and in concert. Soluable portions of the rock masses are dissolved out. Chemical changes are effected changing insoluable to soluable portions. Unequal expansion and contraction crack the masses and detach fragments. Water in the rock seams congealing also disintegrates the rock. Inequalities of the surface and differences of elevatiou concentrate the euergy of the water and eroded fragmeuts of the rocks into distinct chanuels. Through these chanels the water falling on the laud as suow or rain is constautly finding its way back to the ocean, carrying with it, either solvent or mechanically, portious of the land surface which is being disintegrated. The entire laud surface is thus unequally, as regards time, beiug cut down to the base level of the ocean. With the general mass of the rock in place the auriferous lodes are disintegrated and worn down toward the ocean base level. First, from the lodes as from the rock masses, unsized and irregular shaped fragments are broken off; then these are carried away by water, thus exposing fresh surfaces of the rock in place, and the fragments by abrasion and weathering become reduced to a more or less pulverent condition. The separation of the gold from its quartz matrix does not take place when broken out of the lode in place, though the separation may be effected long before the quartz is reduced to sand. The breaking up of the quartz fragment naturally follows the lines of structural weakness. These are in the surfaces where the quartz and gold come in contact and on the crystal surfaces and through the crystals themselves of the metallic sulphides frequently so intimately associated with the gold in lode deposits. One or more faces of the gold particle thus become exposed on the surface of the quartz fragment as a result of fracturing on the planes of structural weakness. The malleable tenacious gold resists abrasion better than the more brilliant quartz, so the latter wears away from around the gold till the latter is left in sufficient relief to become readily detached by the abraiding forces. During this period of gradual breaking up of the auriferous quartz fragment it is being moved from its original situs at a rate dependent on a number of variable conditious and circumstances; ultimately it may reach base level in one or the other form of pebble or saud. The gold particle does not necessarily go with it unless, indeed, the particle is so small that the ratio of its surface to its volume is so large that its specific gravity is neutralized and the particle floats with the stream currents. If, however, the gold particle is not this fine it stops moving and settles to rest finally where freed from the quartz. Other conditions being equal, the movement of quartz fragments containing gold is in the ratio of their several specific gravities. As soon as the volume of the fragment becomes sufficiently reduced for the higher specific gravity of the gold to raise appreciably the specific gravity of the fragment composed of both, its onward movement will become retarded, aud that retardatiou, by increasing frictiou, will accelerate the rate of abrasion, and that in turn again the rate of retardation. Naturally fragments containing coarse particles of gold will wear away quicker and the gold reach its stopping place with less distauce of movement than fragmeuts of quartz containing fiue particles of gold. Thus coarse gold is, other thiugs beiug equal, always left in placers uearer its lode source than fine gold. Frequently, indeed, the fine gold is moved to such distances and distributed through such masses of material that its original connection with the coarse gold in the same lode seems hardly conceivable.

Coarse gold, and indeed the larger portion of the fine gold, in any particular deposit, is usually found immediately on or very close to the bedrock. Occasionally there is a placer deposit in which the gold is found in a stratum of the unconsolidated drift above the bedrock, sometimes ouly a few inches, but just as often over a hundred feet. Fine gold, however, is frequently found distributed iudifferently through a very considerable depth of material without any marked conceutratiou being observed in any particular stratum. These pheuomena of distribution come from the nature of stream erosion, which, though ultimately tending to cut the entire basin down to base level, is at any particular point within that basin an alteruation of periods of cutting and periods of accumulation of the eroded and cut out fragments of some other portion of the stream basin of greater elevatiou above base level. As between any two points on the same stream basin, the cutting periods are longest aud the alteruation of periods least frequent on that poiut in the harder rocks, and the accumulation periods are longest and the alternations most frequent at the point in the softer rocks. These differences are more marked the greater the difference iu hardness of the rock and the further the erosiou is from the ultimate base level. During the cutting periods the grade of the stream channels is greatest, and during the accumulating periods it is lowest. The velocity and carrying power of the stream currents are in the ratio of the grades. As a consequence, the auriferous quartz fragmeuts remain much longer under couditious favorable to abrasion in the accumulatiou periods than in the cutting periods, and of necessity much more gold is entirely separated from its quartz fragmeut; also in the portions of the stream longest under the conditions of accumulating periods there is naturally the largest accumulation of gold—more, therefore, on the softer bedrock than ou the harder bedrock.

As a logical inference, the reason of coarse gold concentration on soft bedrock in preference to hard bedrock is not, as commonly asserted by placer miuers, that the soft bedrock presents a more favorable surface for retaining the gold than the hard, but it is because the great mass of the gold became free from its quartz matrix while over the soft bedrock. The gold being left there stays there till it is taken out by mining operations, aud what is left on the

hard hedrock stays equally well there only there is less of it left. The coucentratiou of the gold on the bedrock is caused by the alternation of periods of cutting with periods of accumulation. The cutting during a cutting period first crodes away the mass of drift of the preceding accumulation period or a portion of it, and as this drift is ordinarily an uucousolidated formation, the stream sorts it over, sweeping out the lighter particles and fragments aud leaving the coarser and heavier to either first be broken up further and theu moved ou, or, as is the case with the gold, to just settle down to the surface of the bedrock and remain there while the bedrock is heing cut away. The more freqnent the alternations of periods the more complete this coucentration becomes. In some iustances it is evident that for a uumber of cutting periods, the last to occur preceding the last accumulation period which is the existing condition of the placer, the cuttiug does not extend dowu to the bedrock but stops at a stratum some distance above it aud the gold is coneentrated in this stratum just as if it were the hedrock, forming in fact what is known among placer miners as an upper lead.

All the pheuomena of the concentratiou of gold are identical with the phenomeua of the placer mining method known as ground sluicing. In this miuing a stream of water is rnu on the surface of the gold-hearing earthy or gravelly deposit, and gradually disintegrates it, being assisted iu this hy the miner with tools for looseuing the surface ou which the water is runuing. The lighter earthy and pebbly particles are carried away hy the stream, hut the gold simply settles to the bottom of the ent, from which it can be taken out coucentrated in a much smaller hulk of earth and gravel. It will be noted that the water, if left to itself, does not cut the deposit on a uniform grade, but rather in a series of uearly level steps and sharper inclined rises betweeu. This is due to the unequal hardness of the earthy and gravelly mass. Iu the softer portions the cutting proceeds more rapidly thau in the harder, but is limited in depth by the harder seetion immediately below, aud in backward extent by the harder section immediately above. The soft portiou is thus cut to a level and the water cnt extends sideways to widen it while both above and below the stream is confined to a narrow cut on a steep grade. On a tremeudous scale this is the identical process of nature making the channel basins of the rivers. In the softer rock sections the stream cuts its bed down to a hase level limited by the slower cutting iu the harder rock section helow and limited up stream by the harder rock seetion there. Once cut back to this harder rock section, the flat portiou now enters on an accumulation period, during which the softer rock becomes eovered with drift, auriferous or uot, as the case may he, till the stream approximates to its maximum possihle grade in this section. During this accumulation period the stream spreads itself over the wider surface of the accumulated drift, but finally as it reaches its maximum grade it again concentrates itself into a single channel not necessarily identical in situs with the former one and enters ou auother cuttiug period.

The enormous intervals of time covered by the periods of cutting aud accnmulation during which the gold has heeu broken out of its primary lode situs and accumulated iu the placers is with difficulty comprehended. But its possihilities aud signifieauce once grasped, the existiug conditions of distrihution are conceivahle without the intervention of extraordiuary activities in uatural forces at some preceding period or the existeuce of richer lode deposits. The fact is that the existiug couditions of placer gold occurrence and distrihution ean readily he, and in the writer's opiuion, in fact are, the accumulatiou of the natural ageneies acting with no more intensity than at the present time ou lode deposits that were of no greater richness than those uow heing mined.

Most placer deposits, in the hroadest sense all, are the resultant of the accumulatiou periods, not of one channel of the same stream, hut of several channels of portions of it. Bars, benches and flats are, iu fact, nothiug but sectious of old stream ehanuel with more or less of the drift of the last accumulatiou period in place. In the surface of the bedrock underneath the unconsolidated drift can be found all the evidences of the direct erosion of a stream channel. These old channels abandoned by the stream at the close of au accumulation period escape suhsequent erosion by it by reason of the stream having made its new channel on one or the other side of the old one. The several channels of the same portion of a stream are not usually found equally auriferous, though to all appearauces equally developed as chaunels in the same rock and filled with identical drift, at least in geueral appearauce. As a general proposition the older the channel the richer in gold, uot because of its age, hut hecause the chanuel was the result of an erosion extending over the longest period of time, and was the result of the concentration of the largest mass of auriferous lode deposits. Just which of several channels is the oldest, or rather which oue was the concentration of the largest volume of auriferous lodes is not always superficially determiuable. It may or may not he the channel of the existing stream flow. For definite determinatiou only a certain amount of miuing is conclusive. Hamburg bar on the Klamath river is a striking example of two channels cut by the same stream, one rich in gold and the other containing little or none. The bar is nothing but the old channel of the Klamath river filled up and superficially ohliterated by an enormous slide (one of the characteristic phenomena of sub-aerial erosiou and denudation) for three-quarters of a mile. The existing river chaunel is alongside of the old one, approximately parallel and ouly a few hundred feet distant. The beds of both chauels have ahout the same level. The preseut chauel has beeu found to eontain very little gold, uot sufficient to justify mining, though ahove aud helow the har it has been profitahly mined. The old channel under the slide has all beeu mined aud fonnd to be as rich as the existing river hed ahove aud helow. The miners would say that the pay lead ran under the bar in the old channel, and they somehow connected the phenomena with a veritable flow of gold in the stream, saying that since the formation of the new channel there had heen no flow of gold in the river. The true explanation of the difference of gold content hetween the channels is in the fact that the new channel has oecupied bnt a fraction of the amount of time iu its formation that was occupied in the formation of the old channel, aud the volume of auriferons lodes eroded during the formation of the new channel is an insignificant fraetion of the volnme eroded during the time of formation of the old chaunel.

(To be Continued.)

California's Greatest Resource.

To the Editor:—I have for a loug time advocated increased energy in the mining interests of our State, and while so doing I am ofteu told hy the persons I speak to that they are afraid to risk their money in prospecting for, or tryiug to develop, paying mines; that it is an extra hazardous husiness. They pretend to have faith in agriculture, fruit-raising and other euterprises of that kind; yet they admit that, owing to the lack of demand aud the low prices, it is almost impossihle to make a liviug at any of these pursuits. House-buildiug and the lumher husiness is no better, nor is there auy industry that offers as fair a reward for the risk of capital as is done by mining. I firmly helieve that quartz-mining, coudncted on sensihle and economic priuciples, on veins that show gold and have indieations of valne, is less uncertain and much more likely to yield a profit to those engaged in it than any other enterprise that can at this time be suggested—in faet, it is the only resource left hy which the prosperity of the State can he revived. There are mauy quartz mines now heiug ruu at a profit in this State. Only a few of them are ever reported—three only were reported last month as dividend-paying—yet we know there were mauy more; many of them private corporations, who work ou aud on, year after year, and say nothing. This is not fair to onr State. We see grand reports from South Afriea, Australia and other parts afar off, while, with a little more euergy on our part, we could match our California mines against anything these places have to show.

If the papers published near the several miuiug camps of this State would seud you a list of the mines in their localities that are paying a profit, or of those that are being developed hy the proceeds of the mine; also of those which are being worked contiuuously and of which not mueh is known; and the number of people who are making a living directly from gold mining, without counting those in this or other bay cities, it would show our citizeus what is being done in the way of miniug in this State aud would give them eourage to invest in an enterprise that has a favorahle show for success. If the farmer finds the soil, climate and other conditions favorable for agriculture, he is willing to purchase laud and engage in farming, knowing from experience that the indications are all right. So it is in mining. If the ledges are strong, well definecl, show gold, and are in a mining region favorably situated for the working and reduction of ores, the miner knows that the indications are all right and that there will he hut slight risk to he takeu. If persons who engage in mining will be tolerably certain that they have a mine and will stiek to it, working skillfully and with economy, they will be as successful. iu as great a number of cases, as the farmers or those in any other industrial enterprise, and will have the advantage that there has heen no recent overproduction and that the product of a gold miue still sells at par. Yours truly,

San Francisco, Oct. 3, 1894. Boreas.

Will Purchase the Mine.

The directors of the Granite Hill Mining and Development Compauy held a meeting a few days ago and decided to purchase the property which they now have houded. The purchase price is $15,000, of which $1500 has already beeu paid. The original owners of the claim are Martin Ford, Mrs. Johu Ford and quite a numher of small shareholders. The mine is looking well and with proper development will douhtless prove a paying property. The company has until November 10th in which to pay over the moucy.—Nevada City Herald.

The Black Sand Gold Question.

To the Editor:—My attention laterally has been recalled to the hlack sand gold question hy an interesting artiele written hy Mr. E. W. Keeler of this eity and puhlished in the *Bulletin* under the heading of "Seashore Gold." Mr. K. says:

> The great difficulty that for years has met every prospector for gold in these black sand deposits that constantly follow the line of tidal upheaval, is the fact that magnetic iron as fine as the grains of gold, and of nearly the same gravity, are found side by side, with a great preponderance of the iron. In some localities there is found in sand twenty-five to forty per cent of pure magnetic iron that is capable of making a quantity of metal equal to the finest imported Swedish. In all ordinary methods of separation this iron is so fine that it is in the way, and interferes with any system of reaching and reclaiming an equally fine particle of gold.

As I see things, the matter of seeuring "the equally fiue particles of gold" is less a task than to find a paying value of this fine leaf gold, and yet I am a believer in the possibility of this. Mr. K. says further:

> In my washing of sand from the vicinity of Gray's Harbor I found at least thirty per cent was of fine magnetic ore. A fire assay of this ore showed a value of $26 of gold per ton.

This $26 per ton simply shows that it is possihle to find rich spots, as in all other classes of mining. A practical paying average would be way below this amount.

That there is, or will be, a commercial value iu this black saud, or rather magnetic iron, seems reasonahle, in the face of such cheap facilities for separating, aud especially where transportation is cheap. Because it has not heen utilized as a profitable venture is uo sign it will not he, in these chauging times of reduced prices on everything, along with improved facilities for separatiug. On the matter of reducing and valne of their iron Mr. K. says:

> I visited the only one in this country, which had been reconstructed in order to utilize these fine magnetic ores, and some 700 tons of the magnetic ore from the black sands, such as I experimented with, was being used. The muck bar iron was so superior that at that time it secured purchasers at $15 per ton over the ordinary.

On this hlack saud gold question, ten years ago I spent a great deal of time and some coin in investigating the whole matter, and published several articles in the Press on the suhject, hnt heing more actively engaged in quartz mining, and there being no especial attention given to the iudustry further thau the old "eatch as you can" plan, I dropped the matter. At the same time I never lost sight of the practical facts. Mr. K. in his article treats simply of the occan beach sands, while my experiments and results exteud through the whole "hlack sand" question as connected with hydraulic, drift, river and placer mining, as well as the sands of the ocean beach.

That the black sand gold indnstry can be made a very important one for the whole Pacifie coast I am well satisfied, if taken hold of and haudled intelligently in a commou-sense, economical and husiness way.

It could, iu my opinion, be put on such a hasis as to give employment for all the surplus lahor of the coast. As to the value of the black sand in a commercial sense, I know hut little. I deal only with the gold question, leaving the hlack sand as a hy-product. As hefore stated, my investigations and experiments were made ten years ago. During the interim I have learned something, and look upon the assertion of its being so difficnlt to save the fine gold associated with these sands as no difficulty whatever. The difficulty, in my mind, is in a plan of cheap separation, for with cheap separation it would hring forth, as stated above, an industry that could employ a vast army of lahorers. Labor is the main factor after having a reasonably paying deposit. The great rednetion in all that pertains to living and lahor in the past ten years adds a greater chance for a profitahle outcome. On the question of profit in the iron sand, that is only a question as far as time is concerned. What is uot valuable to-day may he of great value in a few years wheu cheaper rates and hetter facilities of transportatiou are secured. That avenues will soon open for utilizing the hlack sands seems prohahle in this advancing age. The iron question applies more direetly to the oeean heach sands, as there the accumulation would be greater, and yet in our hydraulic, drift and placer diggings more or less tons can at all times he secured.

Why the hydraulic, drift and placer miners of this State have not paid more attention to the gathering of the "hlack sand" (magnetic iron, etc., all going and practically understood under the head of "black sand") and gold, has always heen a query to me. At a drift miue I once visited, it did not take long to see that a great valne was in their hlack sands, as there was more or less of what they considered "black sand," really gold coated with iron, and looked to the general eye as iron. I selected one special piece and asked the superintendent what he thought it was—iron or gold? He said, off-hauded, that it was iron. I then requested that he look on the opposite side; I had scraped the iron coating off on this side, and he was astonished to see that it was gold. By permissiou, I went to the end of the sluice aud panned

out three pansful of the material, and from the concentrated "black sand" I obtained $7.35 in gold. I then sought to secure the several thousand tons of tailings, but no; they intended to resluice them in the ordinary rough way, and for every dollar they received there were at least $10 washed off, and so it has been for years. We used to wash our sulphurets away in quartz milling, but we have learned better since; and so it will be as regards this black sand in hydraulic and drift mining especially. I can only account for the reckless washing away of these sands for two reasons: First, unbelief as to their value; and second, that if they believe there is a value, then it must be laziness. Hydraulic, drift and placer miners must get over the idea that nothing has a value but bright, free gold. I will also add that there is a great deal of gold otherwise coated which mercury cannot gather, all of which goes into the tailings.

By the way of causing investigation as to what additional value can be obtained from these sands, I will here append the tests made ten years ago. As nothing has a value unless it costs something, I will here state that my curiosity as to values and the working for the cause, is fully satisfied. It should be understood that every miner who produces $2 or more of gold gives, on the average, a day's work to some one who needs it.

TESTS OF HYDRAULIC, DRIFT, RIVER AND OCEAN-BEACH SANDS.

Hydraulic.	Drift.	River.	Ocean beach.
$852 20	$ 60 00	$10 00	$9 32
80 00	15 80	27 90	2 10
347 00	65 50	15 40	3 50
28 75	271 80	17 78	18 50
168 00			18 00
12 00	Average, $103 25	Average, $14 21	2 30
175 00			1 35
51 00			80
221 80			4 20
210 00			1 75
90 00			
140 00			Average, $6 82
98 00			

$152 05 Average.

The large values in hydraulic mining tests can only be accounted for on the ground that the working is all coarse—on the rush—consequently what iron-coated gold there may be is in coarse pieces. The finer the work the more iron and the less value per ton; at the same time more gold as a total in a clean-up of the whole.

In winter time when hundreds of men are clamoring for food, I have often thought of the possibility, with a small outlay for putting up suitable machinery, how every idle man could earn his daily bread. From the Cliff House for five miles down the coast this black sand carries gold, concentrated. I have had as high as $18.50 in value and as low as $1.35 per ton. Taking the general average, it is simply a bread-and-butter proposition, yet that is better than begging.

Thus we may say "the golden shores of California" is no poetic phrase, but a reality, as where beach sands are, the color of gold can be found along the entire coast.

In quartz mining we are getting things down to a very fine per cent in saving the values. Why not get the full values from our hydraulic and drift and other mines? ALMARIN B. PAUL.

Room 5, Crocker B'ld'g, S. F., Oct. 10, 1894.

Mining Operations in Alaska.

The Alaska *Mining Record* says:

The backward spring and ceaseless downpour of rain this summer has deterred the prospector in his search for new discoveries and greatly retarded mining operations generally. Last winter's snowfall, its tardy disappearance this spring and the amount of rain that has fallen this summer are unprecedented within the time of our oldest residents. Prospectors have been unable to get out; or, having made a start, have been unable to get into the hills in the face of the snow and the elements to do any prospecting, and consequently this season has nearly rolled away without any important discoveries having been made, and in comparison with past seasons but few new locations have been recorded. And, too, the low and uncertain price of silver has caused several promising silver discoveries to lie idle which would otherwise have received a fair amount of development work and shipments of ore made to the smelters below. But, notwithstanding the unfavorable elements, a number of companies and individual owners have pushed work as rapidly as possible, and by the close of the season a good showing will have been made. Notable among the improvements during this season and the steady operation of mines and plants are the completion and steady operation of the Mexican sixty-stamp mill; new and extensive improvements at the Treadwell mill and mine; the completion and operation of the Berner's Bay Mining & Milling Co.'s stamp mill and tramway; the steady operation of the Silver Bow Basin Mining Co.'s hydraulic plant in Silver Bow Basin; the completion of this company's stamp mill and the tramway to the Ground Hog mine; improvements and steady operation of the mill at Arehie Campbell's mine; the lease of the Bennett mine and its operation; the operation of the Takou Consolidated mill; the lease and operation of the Silver Queen mine and mill at Sheep creek, and the sale and operation of the Bald Eagle mine at Sum Dum. Other sales and negotiations are now pending on various properties, some of which will take definite shape before spring, and new enterprises will come into the field; and together with the old ones, the season of 1895 will open out with an unusual amount of work and activity.

The Pelton Water Wheel.

The Pelton Water Wheel Company of this city has issued a handsome new catalogue descriptive of the Pelton water wheel, and embracing in its variations of construction and application the Pelton system of power. The system presented, as is well known, offers so many advantages for the general utilization of water power, that streams favorably situated for power purposes are now eagerly sought for and appropriated. By its use the entire force or highest head obtainable can be made available for all industrial purposes with a greatly reduced cost, wider range of application, and fuller adaptation to varying requirements, than has ever before been realized. Nothing in a mechanical way has so signally and quickly demonstrated its own usefulness as well as its right to the first place in hydraulic power appliances. The transmission of power by electricity has opened up a new field and a wider range for the utilization of such sources of power, than has been possible by any previous methods, and the field is continually enlarging as the science advances. There is a large amount of useful information on this subject in the catalogue, and it is so arranged as to be very readable and interesting.

The new catalogue is finely illustrated and contains much information to users of water power. The literature pertaining to modern hydraulic methods as embraced in the Pelton system is quite meager, but an endeavor has been made in this edition of the catalogue to supply in some measure such information—both practical and technical—as will admit of an intelligent estimate of the principles involved in what is now generally conceded to be the most distinctively new and important development in hydraulics that has been made in this century.

The Pelton wheels are now in use all over the world. The invention is one of the most important ever made on the Pacific coast, and its merits are now everywhere recognized. Peltou wheels are now running, almost without exception, every electric station in this country where conditions favor as to head, and in every instance they have been a most pronounced success, making profitable many enterprises that could not be run by steam power without loss. Every plant of this character, so far as is known, has been a good investment, while many may be referred to that have paid from thirty to fifty per cent per annum on the entire outlay. For mining and milling work nothing has ever excelled them. The descriptive pamphlet will be found useful to all miners, mechanical engineers and others likely to be interested in the utilization of water power.

New Chlorination Works.

Messrs. Miller and Beaulieu, general contractors for quartz mills and chlorination works, have just completed at the Rawhide mine for Messrs. Nevils and company a fine, substantial and unique three-ton capacity chlorination works. We examined them recently and greatly admired the workmanship, close application of recent practical science and suggestive mechanical skill. The building proper is 156 feet long by 40 feet wide. The furnace consists of a smokestack 40 feet high and 5½ feet at the base, and of a brick and iron structure 80 feet long and 11 feet wide containing the furnace proper and sulphurets reception department. The floor at both ends of the furnace structure is made of concrete material well and deeply laid. The inside of said furnace structure is lined with the best of English fire-clay, laid with reference to the conservation of the heat forces. On all sides of the brickwork are broad vertical staves of iron two feet apart, sunk deep into the concrete base. They are drawn tight at the top by buck-rods. In fact the top of the brickwork is lined and cross-lined with great rods and bolts of iron. The floors from the discharge end of the furnace are graduated so that the oxidized material may pass easily and at once into the slack tubs and leaching vats. All the angles and top lines of the brickwork are effectually protected with angle iron. Messrs. Miller and Beaulieu built the entire outfit in six weeks from the day of commencement, and competent experts say that the design and execution are remarkable for completeness, for elaborate details, and that they are superior to the famous Augel's Camp chlorination works.—Sonora (Tuolumne Co.) Democrat.

A recent fresh-meat cargo from Australia and New Zealand consisted of 70,000 carcasses of sheep, 9000 haunches of beef, 150 bags of bullocks' hearts, 550 tons of beef, 550 legs of mutton, 150 bags of ox-tails and kidneys, 7 cases of oysters and 750 cases of butter.

There has not been a total eclipse of the sun in London since 1715, and Prof. Holden says there will not be another until after the opening of the twenty-first century.

The Late James H. Crossman.

James H. Crossman, who in a fit of despondency committed suicide in this city last week, was known to a great many readers of the PRESS through his frequent contributions to its columns a few years ago. He was one of the pioneer mining men of California, who had been connected with all its old-time "excitements," and visited most of the camps on the coast. Like all of this class, he had Fortune within his grasp many times; but he died without any estate. In Nevada, "Jim" Crossman was particularly well known and it was there he acquired the sobriquet of "East Ledge Crossman," owing to his enthusiasm and persistence with relation to a great east ledge of the Comstock. Of late years he had confined his operations mainly to San Bernardino county, where he was identified with the Temescal tin mines and the Gabilan gold mines. He made some $10,000 in one of his speculations there a few years since, and this was his last "stake."

Although he was a frequent contributor to the newspapers on mining topics and had considerable experience as a practical miner, he was not an educated engineer. Nevertheless, for a long time he has figured as an "expert," and reported more or less on mining properties. Like most of the old-time miners he was of sanguine temperament and apt to greatly exaggerate the possibilities of profit.

He had a great many peculiar theories about geological formations, etc., but very little real knowledge of the science of geology, for he was never a student, but "picked up" what he knew on the subject and was apt to be very certain that he was right. He was a very much better mining superintendent than mining engineer.

While returning from an examination of a mine near French Gulch, Shasta county, about a year and a half ago, he was badly injured by an accident with a team on the grade, and was confined to his room for many months. It is only a short time since he was enabled to abandon his crutches, and has not been in a position to do any active work since the accident.

"Jim" Crossman, as he was generally known, was a genial, free-handed man, and made many friends in all the mining camps in the Pacific coast. He had wide experience as a miner, but it cannot be said that his reports on properties carried any great weight, which was largely owing, no doubt, to his very sanguine disposition. His knowledge was of a practical character, however, but more of the kind adapted to every-day work than that required to judge of the prospective value of a mine.

The Lesson of a Naval Battle.

The great naval battle at the mouth of the Yalu river threatens to revolutionize naval architecture. While some of those connected with the construction of our own naval vessels are still holding out for armor-clad leviathans and poon-poohing the idea that a navy can be worth anything whose strength is not based on these monsters, some of the most distinguished authorities in this country and very many abroad are earnest in their advocacy of swift cruisers. Many of them had favored cruisers rather than immense armor-clad ships before the Yalu battle, and the results of that fight confirmed their judgment. Several of the most famous naval experts in Germany and Great Britain are communicating their views to the press on the same subject, and maintaining the same opinions.

They claim that in building immense armor-clad battleships speed must be sacrificed to the defensive features, and that it was demonstrated in the battle between the Japanese and the Chinese that speed is indispensable. The Chinese ships were fought with great bravery, but the smaller and swifter ships of the Japanese had them at a disadvantage. They were able to shift their positions in much shorter time and strike their opponents without exposing themselves, and they could get out of the way so much more readily that practically the fight was one-sided. These are the deductions from the meager reports thus far received of the engagement, and they will probably be confirmed by later particulars. The Japs are quicker and more eager fighters and more intelligent, but they were materially aided by the superior speed of their vessels, which enabled them to outmaneuver the Chinese at every point.

Another very important naval deduction is made from the war as far as it has progressed, and that is the tremendous significance of sea power in waging war, says the Baltimore *American*. The Japs, owing to the superiority of their navy, or, to speak more correctly, the superior use they have made of it, have been able to land troops in Corea at any point with impunity, whereas, had the Chinese navy been put to a proper use, or had it been superior, very few troops could have been landed in Corea, and the Chinese would not now be quaking in their boots for fear that their capital will be taken and the Government overthrown. This feature of the war is being earnestly discussed in the foreign papers, and the suggestion made that more consideration be given in future to sea power. The suggestion is as applicable here as in Europe.—Chicago Journal.

Scientific Progress.

Pumping Wind Into the Earth.

What is known as the Heckert-Rowland plan for generating natural gas in the bowels of the earth is about to be given a practical demonstration in Findlay, O. The necessary pumps and engines are now being erected on the site of the old Wetherald rolling mills in the northeastern part of the city. This is in the vicinity of several abandoned gas wells, which will be utilized for conducting the experiments. The theory, which was evolved by William Heckert, a well known mechanical engineer, at present a member of the Findlay City Council, will work a revolution in the natural gas region if it proves practical.

Heckert proposes, by means of powerful pumps, to force air down into the gas-bearing rocks, which it will permeate, and thereby become infused with the active properties of the gas itself. It is contended that, as now burned for fuel, the natural gas requires an admixture of nine parts of air to one part of gas, and that this mixing can as well be done in the earth as in the stove or in the furnace where it is burned. The great trouble in the gas region is not so much the decrease in the volume of gas as the decrease in the pressure. This has fallen off, in a large portion of the Ohio field, from 400 pounds, at which it started, to 40 and 80 pounds, and this is found to be insufficient to convey the gas from the wells through the system of pipes to the point of consumption. The friction takes up all the initial pressure.

By Heckert's process this lost pressure will be re-established. His air pumps, constantly at work, will force enough air down one hole to create a pressure sufficient to force the remaining gas, mixed with the air, out of several other holes, and gives it a strong initial pressure in the pipes. The gas thus formed, or charged with air, will be ready for burning with little additional mixture of air at the point of combustion. It is also claimed by Heckert that air thus pumped down into the rock, and passing over and through the pools of oil which are now almost universal in the Trenton rock in this section, will take up the volatile gas of the oil and force it up the convenient wells ready for use.

Inside of a month or two the preparations for the trial of this important theory will be made.

A World-Circuit Telegram.

One day last April a telegram was put into the hands of the courteous chief engineer of the British postal service, Mr. W. H. Preece, with the request that he would say whether it could be sent around the world by a certain route, and if so, what time it would take and what it would cost per word. When the person who made this inquiry went a few days later to look after the progress of the telegram, Mr. Preece shook his head. "The whole foreign department are at it," he said, "and they are tearing their hair and protesting, but you shall have it soon." The route planned was rather erratic. It asked that the message be sent by a circuit which would take in the entire telegraphic field of the world, touching at the most remote points, but never leaving the land line or the cable; that is, never being transferred by post or messenger from one point to another. Starting at San Francisco, the route ran across the continent to New York by Vancouver and Moutreal. From New York it followed the world's northern telegraphic boundaries through England, Norway, Sweden, Russia and Siberia. Going south, it touched at Nagasaki in Japan, Hongkong in China, Singapore, Java and Sumatra, crossed Australia and landed in New Zealand. Returning to Singapore it crossed to Bombay, made a detour to Ceylon, then on to Aden, rounded the Cape of Good Hope, leaving the line at Zanzibar to call at Seychelles and Mauritius, mounted the west African coast to St. Louis in Senegal, crossed the south Atlantic to Permambuco, traversed South America from Buenos Ayres to Valparaiso, and then went north through Mexico to New York. In a few days, true to his promise, Mr. Preece had the answer ready. The telegram could be sent. It would require about fifty-six hours, and would cost about ninety francs ($18) per word.—World's Progress.

A Faded Signature Brought to Light by the Camera.

An instance of the use of photography in important legal matters is given, says the *World's Progress*, in what is known as the famous Stubblefield-Munford controversy. It involved the ownership of 1500 acres of valuable land in Fayette county, Ohio. During Monroe's administration this tract was willed by one of the old Munfords to his five heirs, and the present suit was brought on the deed of sale signed by them. The Munford heirs deeded the land to Stubblefield, who afterward sold parts of it to different parties, who had to pay twice for their land. The deed of sale, discolored and yellow with age, showed only four signatures and a space for a fifth, and the closest scrutiny could not discover the fifth. On this signature turned the question at issue. It was finally decided to photograph the signatures and see if the course would disclose the fifth name. This was done under the direction of the court by a photographic expert named Spencer, and under the closest watch of the clerk of the court, who could not allow the original to leave his hands. On the plate he saw traces of the signature, and, on enlarging the negative ten times, the entire name was as plainly seen as when written.—Bostou Journal of Commerce.

Easy Climbing at Night.

Many bicycle riders have woudered why hills are much easier to ascend in the dark than in the daylight. The simple explanation of this curious fact, as given in the *Bi-News*, is that "what the eye does not see the heart does not grieve over. The brain waste does not go on so rapidly when the eye sees little or nothing to waste it, by worrying about what has to be done before the steep is conquered." The writer adds that if a rider will select a hill just beyond his powers and "have a shot at it when he can see only a yard or two before him," he will find that he can surmount it with ease.

A NEW EXPLOSIVE, manufactured by the government of Great Britain, has lately drawn much attention. It is called "cordite," and is an invention of Prof. Abel. It is in the main a similar product to the smokeless powders of other nations. The name "cordite" originates in the process of manufacture, during which the gun cotton, after being combined with a sort of explosive gelatine, is pressed through a plate with fine openings, thus receiving the shape of fine threads. The object of this process is that by proper selection of the thickness of the threads it offers great latitude in the control of the swiftness of the explosion, which is in other powders attained by the finer or coarser grain of the particles. One can, therefore, according to requirements, manufacture a quickly combustible explosive for mining purposes, or a slowly burning, driving power for projectiles. Cordite can be plated into cords, which naturally increases its availability for practical use. The judicial side of the cordite manufacture offers special interest, as the well-knowu firm of Alfred Noble—the inventor of dynamite—had instituted a lawsuit against the English Government for infringement of its patent rights. But although the modern manufacture of explosives rests mainly on Mr. Noble's efforts, the firm lost its suit because the fundamentary patents had expired.

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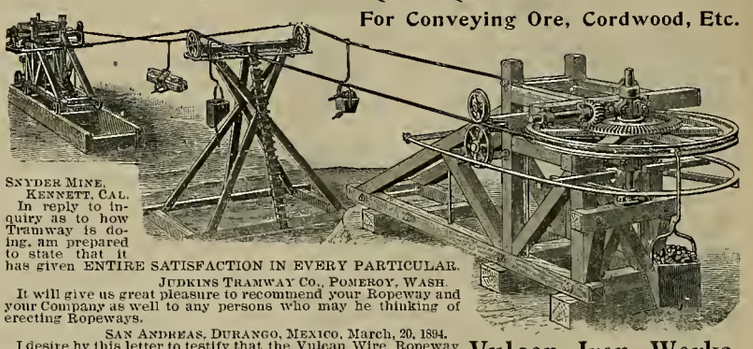

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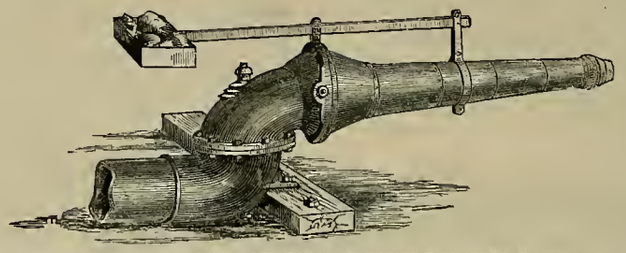

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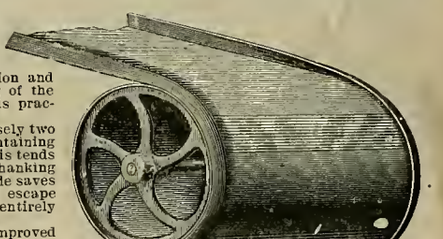

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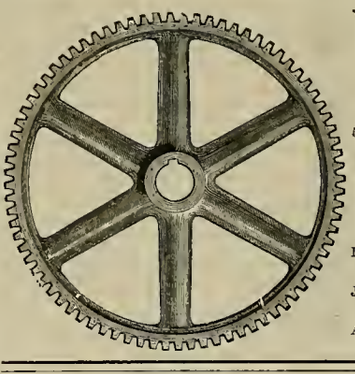

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Mechanical Progress.

Hydraulic Propulsion of Vessels.

Among recent notable inventions is a device for the hydraulic propulsion of vessels, by Mr. James C. Walker of Waco, Texas, adapted to river craft as well as to ocean and lake propellers. The present invention may properly be considered as auxiliary to one patented by the same inventor some time previously. The two inventions combined represent a vessel propelled by longitudinal tubular waterways (submerged), the water being forced by spiral wheels driven by engine power with great force and ejected in jets at nozzles rearwardly directed, the reactive force of which jets propels the vessel. The improvement also comprises means for the drainage or expulsion of the water that may accumulate in the hold of the vessel. The tubular waterways already mentioned extend fore and aft, being larger in front and tapering toward the stern. Lateral branches project through the sides of the hull, each terminating with a nozzle pivoted in a ball and socket connection. The nozzle is curved to be presented in the plane of progress, and is arranged reversible to back the vessel. The rear nozzles are arranged for lateral swing to serve for steering the vessel as well as for propulsion. Means are provided, embodying a rack bar and pinion mechanism, whereby the side series of nozzles can be reversed simultaneously. The drainage feature comprises a depression or well in the lowest part of the hold. A pipe leads from this to the stern at a point above the water line and projects outward. A branch pipe is led from the propulsion pipe and joins the drain pipe near its terminus, and the junction is outwardly directed. When the drainage is to be effected, a portion of the water from the propulsion tube is directed through the branch, and the discharge of water causes a suction draft that takes all the accumulation from the well in the hold. Fire plugs are also provided at intervals, to which hose can be attached in case of fire, the pressure of water being ample to force the stream for extinguishing the fire. Suitable valves are provided in the pipes to shut out the water in case of any necessity therefor.

Crude Oil as Fuel.

On Friday night last Mr. A. M. Hunt gave an address before the Technical Society in this city on "Crude Oil and Its Use as Fuel." In presenting the subject he said that the output of oil in this State is about 50,000 barrels a mouth, the product being in some cases very light and in others quite heavy. So far oil in any considerable quantities has only been found in southern California.

The cost of transportation he found operated against its use to any great extent outside of the sections in which it is mined, giving coal the advantage. In discussing the methods employed in burning oil he had found that small burners produced better combustion and generally gave better results. He said that it was almost impossible to get a satisfactory comparison of the relative adaptability of oil and coal as a fuel, but from extensive experiments made during the Midwinter Fair he believes that oil was three to one times as valuable as its rival.

In the matter of economy in handling, in cleanliness and in the saving of labor there could be no comparison. He also pointed out the direct advantage gained in the use of oil is that perfect control of the burner exists, thus preventing waste. He had found, too, that its action on the boilers was less destructive than coal. He believed that there was not a smithy in the city which could not make a great saving by its use.

The manufacturers about Los Angeles were, he said, nearly all using it in their plants, and could not be induced to return to the flint fuel. A number of wells are being sunk in that locality.

In the discussion which followed the address one of the members said that the supply of oil in the State was comparatively insignificant, and he thought would have to be increased considerably before it would be used to any extent in large plants. He thought, in view of this fact, that anything like a general adoption of petroleum by manufacturers would have the effect of totally exhausting the supply in short order.

A NEW KIND OF ELEVATOR for use in mines is mentioned by the English mining journals. It is constructed so that one side exactly balances the other. On one side is a large cage on which a loaded car is run, to be hoisted to the top of the mill, and on the other is a huge iron water tank capable of holding sufficient water to raise the car, load and carman to the top. The carman, from his station at the bottom, pulls a rope which opens a stop cock and fills the tank with water, at which the tanks descends, and the cage, containing car, carman and all, rises to the top of the bin, when the car is dumped. The carman then pulls another rope, which opens a valve at the bottom of the tank and lets the water out, and thus the cage and car, now being the heaviest, descends, its movement, of course, being always under the control of the operator or carman. The cage is provided with strong brakes, capable of holding it and the contents stationary at any point, either in going up or coming down, and the whole is hung on an eight-foot wheel by a one-and-a-half inch wire rope of great holding capacity.

THERE is a class of mechanics, says the *Scientific Machinist*, in which is numbered many excellent workmen, who never miss an opportunity to laugh to scorn the knowledge of the "school" bred artisan and the young mechanical engineer from a technical college. They are full of "wise saws and modern instances," the intended deductions from which are that those artisans and engineers are ignoramuses and asses, judged from the standpoint of "practical" mechanics. These practical men are entirely sincere, and would be surprised to be told their egotism is more of an obstacle to usefulness than the alleged impracticability of the objects of their criticism. The manual training, trade and engineering schools are yet young, but old enough to demonstrate the great practical benefit of the training they give.

Washington Navy Yard.

If it were not for the Ordnance Department, the Washington Navy Yard would practically be deserted at this time of year. Of course, the enrollment of marines and the enlistment of sailors goes on all the year round, but in the summer months many of the officers are away on their vacations, and the yard, as a whole, wears a look of peace. The gun shops and projectile departments apparently do not suffer from the depression. It is in these departments that the Government comes more closely in competition with outside manufacturers and outside interests than in any other branch. The employes are paid per diem wages, which are regulated by the wages paid at similar private establishments, and are not allowed leave with pay, as is the case with other Government departments.

Despite the fact that several of the new cruisers are awaiting their armaments, and that other ships will soon be in the same condition, the working force of the Ordnance Department has been reduced one-half since the beginning of the year. Where 2000 men were employed a year ago, there are now only 1000, and it is feared that the force will be still further reduced.

In the south gun shop there are at present twelve guns nearly ready for shipment. Ten of them have been completed and the eleventh is being polished. These guns are among the finest in the world. They weigh sixty tons apiece, are forty feet in length, and have a caliber of thirteen inches. The projectile designed for these monsters weighs 1100 pounds, and when backed by 550 pounds of powder will travel thirteen miles.

It is believed in navy circles that these will be the last guns of this enormous size to be manufactured by Uncle Sam. They are unwieldy, take up too much room, require too many appliances for loading, and are too expensive. The tendency is toward lighter guns, which will fire projectiles having a greater piercing power. It is altogether likely that in a few years no guns will be manufactured in this country with a caliber exceeding ten inches.

THE Panama canal scheme is being revived. Sixty million francs have been raised. The project can be completed, it is thought, with a series of six locks at a cost of five hundred million francs.

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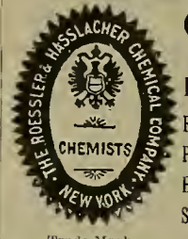

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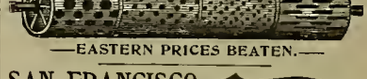
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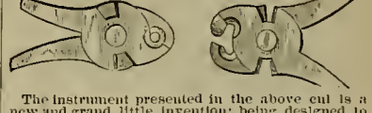
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

WATER FOR MINES.—*Republican:* The Blue Lakes Water Company are putting in a new pipe line to carry water through Oneida valley, from Tanner hill to Kennedy hill. There are two pipe lines at present, one a fifteen-inch and the other eighteen-inch. Both have been used, as the water required for the Argonaut and Kennedy is too much for one line of pipe to carry. The new pipe line will be twenty-four inches capacity, and will be sufficient of itself to carry all the water required for the mines south of Oneida.

FROM PLYMOUTH.—*Republican:* Everything in the mining line is moving along satisfactorily. A new hoist has been erected at the Lucille. Rapid progress is being made in the shaft, and work is being pushed on the forty-stamp mill.

Negotiations are in progress for the bonding or sale of the Ivanhoe, owned by Wild and Wheeler Bros. A five-stamp mill was erected by the owners, and considerable good paying ore was taken out, but the water bothered, and on account of lack of capital work was suspended.

The new mill at the Bay State is rapidly nearing completion, and sinking is in progress. Everything looks well at this mine.

Dr. Boysou has his machinery all on the ground for his mill at the Pioneer, and it will not he long before the doctor will be crushing rock.

GOVER.—*Republican:* It is reported that James M. McDonald has purchased the first mortgage, held by the Anglo-California bank, on the Gover mine, amounting to $25,000. Whether this will lead to the resumption of work on the property remains to he seen. So far nothing has been done beyond keeping the water out of the mine. The flow of water has abated considerably of late.

DEAD SHEEP MINE.—This mine is situated in Pioneer district, and is owned by A. W. Kimball and three others, owning one-quarter each. They have just completed the erection of hoisting machinery to he operated by steam power. The machinery was obtained from an abandoned mine in Glencoe district, Calaveras county. The shaft of the Dead Sheep is down 170 feet—the deepest in Pioneer district. Several drifts and cross-cuts have been run, showing the vein to be from a few inches to three and four feet in width, the rock being of the high grade character usually met with in that locality. It is claimed that it will go to $160 per ton. The sulphurets are said to be very rich, and all the tailings were run into a reservoir, to be worked over again when better facilities for saving gold could he had. Recently the Gracey mill has been improved by the addition of a couple of concentrators, and it was started up this week on tailings left from the previous run. These tailings assay from $60 to $80 per ton.

BRIGHT.—The delay in the starting up of this mine is due to some defect in papers. There is abundance of capital behind the company. There are 20 men in the enterprise, all men of means, who agree to put up to the extent of $5000 if necessary in the development of the property. This is the way the Kennedy mine was reopened and brought to its present status as one of the leading mines of the State. Several of the parties connected with the Bright enterprise are also heavy stockholders in the Kennedy.

PIONEER DISTRICT.—Mining has taken on a small boom in this, the most easterly district in the county—in active operation. There are three claims upon which work is being done at present: the Dead Sheep, the Grieshach, and the claim which is being opened by Mr. Weeks of San Francisco.

Calaveras.

A GOOD PROPERTY.—*Chronicle:* Work at the Lamphear mine is progressing favorably, and what is still better the ore extracted is paying a dividend to the owners of the mine. The last cleanup, after a thirty days' run, yielded $6341. The cost of getting the ore, milling, etc., was $1000, leaving a profit of $5341. Since the bonding of the mine by the company there has been taken out $10,851, and the total expenses were $1800, leaving as a clear profit for the owners of the mine the neat little sum of $9051. And when it is taken into consideration that all this was done while the work of development was going on in the mine, and during a period of less than six weeks, proves beyond a doubt that the property will be a permanent, dividend-paying proposition. We have been informed by reliable authority that the present company have refused an offer of $100,000 for their property.

THE HERROLD MINE.—Calaveras *Chronicle:* Work on the Herrold mine at Big Bar Bridge on the Mokelumne River is progressing even better than the management expected, considering the brief time that has elapsed since the property changed hands a little over a month ago. Under the new management an adit tunnel 100 feet in length has been run from the south bank of the river in the distance of the ore vein. It is thought that sixty feet more will cut the lode sixty feet below the upper tunnel. In the meantime the four-roller Huntington mill is kept at work day times from a winze that is being sunk from the upper tunnel. Night and day shifts are at work both in the tunnel and winze, and ten men are employed in and about the mine. The first run of fifteen tons from the mine under the present management was cleaned up and proved very satisfactory. The quartz much resembles the Mother vein ores, excepting in the one feature that the galena sulphurets are more generally met with here than on the Mother Lodes proper. The winze is now down twenty feet and sinking is being carried on at the rate of three feet per day. The mill is taking quicksilver for $15 per ton ore.

The Herrold mine is opposite to the Moser mine on the north of the granite horse or protrusion in the Mother Zone. We predict for the Herrold a bright future.

Inyo.

BIG PINE.—*Register:* Mr. Rochford of the Montezuma has lately found a ledge of travertine, a few miles from Big Pine. This stone polishes nicely and is quite extensive.

The developments at the Ibex mine, under the supervision of Sam Thompson, are progressing rapidly. He reports an eight-foot ledge, carrying a good quality of ore.

The mines at Fish Springs are looking well, and the boys are doing fairly well for the season.

Kern.

REDROCK AND GOLER.—Inyo *Register:* We learn that probably 100 men are at work in that section, and doing well. Nuggets of some size are being found, one lately picked up being worth $428. These nuggets are covered with a lime crust. The finder of the $428 nugget did not know that he had picked up gold until happening to rub the chunk on his overalls, thus wiping off the lime, he saw the yellow metal shining. In Goler another lucky miner found a little stack of nuggets in a compact pyramid, looking as though they had been all buried or hidden together at some time. The claims known as the Mexican were sold recently to R. F. Del Valle, the prominent Los Angeles politician. The work being done by the Bonanza Company is expected to make a valuable property, as it will substitute sluices for dry washing, and work the dirt to better advantage than is now done. Good discoveries are reported from Black Mountain, the section in which the Brockman claims are located. Altogether, it seems that while the Redrock excitement is quieting down, that country is proving its worth.

Mariposa.

RECENT INVESTMENTS.—Grass Valley *Telegraph:* Chas. E. Uren, mining and civil engineer, has been in Mariposa county and he has done some important work there. Our reporter interviewed the gentleman and he furnished us with the following interesting news: Considerable capital has been recently invested in the mines along the mother lode in Mariposa county, and the people are naturally rejoicing over the prospect of renewed activity in the mining industry which has remained dormant for nearly thirty years. Within the last few months capitalists have been buying mines outside of the grant.

The Sierra Buttes Company of Sierra county, an English company, has recently purchased several mines at Whitlock and is making extensive preparations to work them in the spring. These mines are reputed to he rich and are situated on the mother lode.

Another company has purchased the Cook mines, situated immediately south of Coulterville, and is also making preparations to work them extensively.

A San Francisco company—the California Mining Company—is at present working the Crown Peak mines, near Bear valley on the Merced river, nearly adjoining the celebrated Josephine mine. All of these are on the mother lode and will unquestionably develop into good properties.

Nevada.

LAWREY MINE PURCHASED.—Grass Valley *Union:* Jas. M. Wishart of Topeka, Kan., and E. F. Aiken of Oakland have bought the Lawrey mine on Winchester Hill. The mine now becomes the property of the Rosehill Gold Mining Company, and work will be pushed on it shortly.

LIVE YANKEE.—*Transcript:* The company having a bond on the old Live Yankee or Fortuna mine, on the Grass Valley road, are getting ready for active work. The machinery is being thoroughly overhauled, and is to be reset upon a concrete foundation. New buildings are to be erected and everything put in good shape.

THE REWARD MINE.—Nevada *Transcript:* It is expected that the drain tunnel that is being run to tap the Reward mine will be completed in a few weeks. About 100 feet are yet to be run. This tunnel will drain the mine to a depth of 500 feet. It is the company's intention to crowd work in the mine as soon as this tunnel is completed and to open up the property in a thorough manner. They have a good ledge, which is thought to be an extension of the old California mine. In running the drain tunnel several shoots of quartz were cut through, but only that which was in a direct line with the tunnel was taken out. Twenty tons of this rock was crushed a few days ago and paid about $20 per ton. The Reward is owned by R. C. Walrath, Joseph Thomas and others, and is located near the old rifle grounds. We expect to see a good force of men at work there before many months.

NEVADA.

Kennedy District.

THE GOLD CAMP.—Reno *Journal:* A *Journal* representative met J. A. Blossom, and had a conversation with him regarding the mining outlook in Lander and Humboldt counties. Mr. Blossom had just returned from Kennedy District, the new El Dorado, which is attracting more attention at the present time than any other mining section of the coast. In reply to a question by a reporter, Mr. Blossom said:

"Yes, the mines in Kennedy District look well and are quite extensive. The Imperial mill has made two successful runs and demonstrated beyond a doubt that the heavy sulphuret ores of the district can be successfully and profitably reduced on the ground. Mr. Austin is prepared to erect works to reduce ores that have been considered too refractory to be worked by ordinary mill process. The Imperial mill is running steadily and the Jenkins mill will be ready to start up about October 6th on Pride of the Mountian ore. There are many mining locations in the district, some of which have been developed to a considerable extent. Besides the Imperial, there is the Gold Note, better known as the Irish Boy's mine.

"The vein has been cut in the lower tunnel, which is 300 feet from the surface on the course of the vein. At the greatest depth attained the vein is three feet wide and the ore averages from $50 to $100 per ton in gold. Wiggins and Wilson have struck the same vein or a similar one in their mine. I am informed that a shipment of ore from this mine yielded about $100 a ton at the Reno Reduction Works. A dozen or more mines are being developed, and besides those mentioned the Crown Point and the Sam & Bloss group give promise of being good properties.

"What are the facilities for working ores in the camp?" queried the reporter.

"There is plenty of ore for milling and domestic purposes," replied Mr. Blossom. "Nut pine wood is delivered in quantity at $5 per cord and sagebrush at $2 per cord."

"It is reported that the town of Kennedy is being built rapidly and substantially," said the reporter.

"Yes," said Mr. Blossom, "there are several two-story buildings already erected in Kennedy. There are three stores which deal in general merchandise, five or six restaurants, two or three lodging houses, two assay offices, two or three blacksmith shops, two meat markets, a town hall, a newspaper office—*New Era*—and several saloons, and there will be 350 or 400 votes polled in November. There are two stages, one daily and one tri-weekly, to the railroad and Winnemucca, and freight is laid down in the town for $15 per ton from the Central Pacific railroad. The town is 35 miles from Bridges station on the Nevada Central, but at present freight is hauled exclusively from Winnemucca and Battle Mountain. The permanency of the mines is assured beyond doubt, and in my opinion Kennedy will within a year he one of the most productive mining districts in the State."

Washoe District.

SIERRA NEVADA.—Virginia *Enterprise:* The north lateral drift No. 2, started at a point 385 feet west from the mouth of intermediate tunnel, has been advanced eighteen feet; total length 168 feet; face in quartz, clay and porphyry.

The northwest drift at a point 100 feet west of the mouth of the Dayton tunnel, is out ten feet; face in prophyry and quartz.

The east crosscut No. 1, from north lateral drift No. 2, at a point 140 feet north of intermediate tunnel, is out twelve feet; face in quartz and porphyry.

S. N., M. & U. SHAFT.—The east crosscut from the north lateral drift, 450 feet north of the west drift, 1520 feet west of the shaft, 900 level, has been advanced during the week twenty-six feet; total length, ninety-six feet; face in quartz, clay and porphyry.

The west crosscut from the Union Con. south lateral drift from the west drift, 1520 feet west of the shaft, 900 level, has been extended twenty-four feet during the week; total length, 102 feet; face in clay and porphyry.

UNION SHAFT.—East crosscut from the north lateral drift, 450 feet north of west drift, 1520 feet west of shaft, 900 level, has been advanced during the week twenty-six feet; total length, ninety-six feet; face in quartz and porphyry. The west crosscut from Union Con. south lateral drift from west drift, 1520 feet west of shaft, has been extended twenty-four feet during the week: total length, 102 feet; face in clay and porphyry.

CHOLLAR.—From the west crosscut thirty feet south of our north line, 450 level, we have run north and south on the ore cut in the crosscut and found it extended twenty feet in each way. We are now raising over the crosscut and are now up ten feet; the pay is four feet wide in the top, and assays from $25 to $60 per ton per face samples.

We are making good progress in the work of cleaning out and repairing the north drift on the 550 level, and in retimbering the 900 station at the top of the main incline.

POTOSI.—Crosscut No. 5, started from the south drift, 450 level, was extended twenty-seven feet; total length seventy-four feet. Face is clay and porphyry.

The winze from the surface 180 feet south of north line, is cleaned out and repaired to the depth of ninety feet; from the bottom of which a drift has been started to the northwest.

WARD COMBINATION SHAFT.—The west drift from Ward shaft, 820 level, was advanced sixteen feet during the week; total length, 1122 feet; face in soft porphyry with a slight seepage of water.

BULLION.—The west drift from the Ward shaft, 820 level, has been extended sixteen feet during the week; total length, 1122 feet; face in soft porphyry and clay with a slight seepage of water.

ALPHA.—During the past week have cleaned out and retimbered five feet of the shaft below the 220 level; total depth of shaft cleaned out and retimbered, 385 feet. We have cleaned out and hulkheaded the 482 station.

ARIZONA.

BULLION YIELD.—Yuma *Times:* The gold yield of Arizona for the twelve months ending June 30th, this year, was more than $2,000,000, and from the present rate of production the output for the year 1894 will reach over $4,000,000. This is certainly most encouraging. The silver output for the same period was over $2,000,000 in value, which, had the old price prevailed, would have reached nearly $4,000,000. The copper output was over 45,000,000 pounds, and there was over 5,000,000 pounds of lead; yet there be those who seem to think that Arizona is not keeping up her quota of bullion production.

PROMISING.—It is reported from the People's Mining, Milling and Investment Co.'s camp, in the Gunsight district, that in the sixty-seven foot shaft, where the ore was broken off, the lead has again been struck and the ore is good. Everything looks promising in the camp.

COLORADO.

A MILLING CENTER.—*Gazette:* Idaho Springs is rapidly becoming a great milling center. It has not been so many years since that a stamp mill or concentrator was thought to be a losing venture here. Now we have not enough of such mills. The Donalson and Silver Age concentrators are taxed to their utmost capacity, and even then cannot handle all their ore, and the stamp mills Viz, Mixsell, Thomas, Wilkie, Bismark, Newton and the Donalson are running full blast day and night. Surely there must be some one taking out money. If we were away on top of the range, or 200 miles from civilization, what a great camp this would be!

MONTANA.

A PROSPEROUS CAMP.—Helena *Independent:* A quartz camp that is attracting much attention just now is that in Lump gulch. It is situated on the west side of Prickly Pear, two miles north of Clancy, or about thirteen miles southeast of Helena, and nearly opposite the old Legal Tender mine, where over a million dollars was taken out in the early days, people having been going over the ground for twenty years. The leads are only a foot wide on top, but increase to two feet at a depth of 300 feet. The ores are refractory, containing zinc and silver, but the zinc runs into lead as depth is attained, and they go about 250 ounces in silver to the ton. The leads run north of east and south of west, and go down perpendicular, running across the granite formation, which mineralogists say are true fissure veins. Two steam hoists are on the Liverpool and Washington claims, which are down 200 and 300 feet respectively. The ores from these mines are shipped to the East Helena smelter. Two lines of railroad pass by the mouth of the gulch, where a townsite is said to have been surveyed. About 100 men are working for wages in the camp, which is probably three miles square, and as many more are prospecting.

THE FREED GROUP SOLD.—*Northwest:* An English syndicate has effected the purchase from M. M. Freed, of Dillon, of his well known group of gold properties situated on the Big Hole river in Madison county and about twelve miles from Melrose. The price agreed upon is $425,000. The first payment of $20,000 is due in thirty days. One of the points in the agreement is that a forty-stamp mill be immediately erected upon the property and that $100,000 be expended in development work, which shall include the erection of mills and their equipment with machinery, electric light plant and all other necessary buildings.

The deal has been developing for nearly a year and most of the negotiations were carried on by cable, one of the minor items in the matter being a bill of $1500 for cablegrams alone. Messrs. Birkin and Yound, who looked after the English end of the bargain, represent one of the richest mining syndicates in England. The title of the new company is the Madison County Gold Mining Company, Limited.

NEW MEXICO.

GOLD.—*Southwest Sentinel:* The Mammoth, Atlantic and Bell mines are all running in Pinos Altos, grinding out gold.

The fourth level has been started on the famous Texas mine at Central, at a depth of 300 feet. Five men are at work carrying ahead development.

A hundred and twenty-five carloads of iron ore were shipped from the Hanover district during September. This is the largest amount yet shipped from Hanover during any one month.

The Barringer syndicate shipped seventy carloads of iron ore from Grant county to the smelter at Pueblo last month. This iron ore is noted for its purity and excellent qualities.

On the Grand Central mine at Central a drift is being pushed east at a depth of 140 feet. This drift is now about fifty-five feet long. A shipment of four tons of first-class ore was made last week which ran $40 in gold and 250 ounces in silver to the ton. Messrs. Potter & Craig, the lessees, are now sorting out a carload of second-class ore for shipment. They expect to sort this ore up so as to run about $10 in gold and eighty ounces in silver

OREGON.

BROWNTOWN NOTES.—Rogue River *Courier:* Baldwin and the Skeeter Bros. are pushing down their incline, with the ledge in full view, showing a compact body of good ore.

Roht. Dieky and others are fixing to open up a placer mine on Johnson's gulch.

Krouse and Frank Floyd have found some good quartz on the Main Divide, which they hope to develop next spring.

The Riese Bros. have found some good placer ground on one of the tributaries of the Rim gulch, and are working hard.

Hopkins, Croshy and Bridges have been doing some development work on the Sunny Side lode, a ledge at the head of Malvania gulch, which, although small on the surface, seems to increase in breadth as it goes down, and which prospects well in free gold.

Clemn is opening a new tunnel on the old Enterprise lode, which will tap the pay chute at a depth of seventy-five feet; here there is a large body of ore, all of which prospects in free gold to the pan.

Gardner is fixing up to work his placer claim on the left-hand fork during the winter. In the spring he proposes to sink deep on a quartz ledge which he opened this summer.

Mr. Ireland with his crew of seven are hard at work on their new ditch and dam. This is a Roseburg company with sixteen members and 320 acres of mining ground.

ANOTHER STAMP MILL. — Rogue River *Courier:* The Bone of Contention owners are busy setting up an eight-stamp mill at the

works. A. Sparlin and son Ira have been hauling the plant, which arrived from San Francisco last week. L. J. Kendrick, the superintendent, reports a tunnel 500 feet into the mountain and a well-defined streak of pay ore four feet wide between walls. The pay streak sometimes narrows to two inches, but the distance between walls averages four feet. Some big developments are expected from this mine.

THE WIMER PLACERS.—The owners of the Wimer placer mines near Waldo have spent several years constructing a free outlet for their tailings and are now on the eve of attracting some of their richest banks and making big money. Perseverance and push have accomplished much in bringing these golden buttes under the monitor's influence and the reward is nigh.

DOC IRELAND BAR.—T. J. Clark and F. H. Riggs have a paying placer on Doc Ireland bar near Grave creek, ten miles below Leland. They have eighty acres of pay dirt and water for six months in the year, with eighty-foot pressure. A ditch and flume bring the water from Rock creek, three and a half miles away.

WASHINGTON.

FROM LOOMISTON. *Journal:* Messrs. Miller, Redpath and Winchell contemplate putting in a winter's work on their claims on Mt. Chapaca. They are now building their cabin and have employed Harry Moore to help them. Their mines lay not far from the famous Rush group, and we predict that their efforts will help to make old Chapaca great.

Messrs. Hunter, Griffin and Wm. Chilson returned Monday evening from a ten days' trip into British Columbia on the north fork of Kettle river. They brought in some exceedingly fine ore—a new discovery of Mr. Griffin's—and they say that they have made a very important find.

Messrs. Miller, Winchell and Redpath will probably make a run of twenty tons or so of their ore this fall. They now have about 100 tons on the dump.

WAGON ROAD TO THE MINES.—Spokane *Review:* C. P. Ondin returned yesterday from the Trail creek mines. He says the wagon road from Northport to the mining camps will be finished in ten days and a large quantity of gold will come out during the coming winter. He brought down a well filled chamois purse as evidence that the five-stamp mill on the O. K. is doing good work.

ALASKA.

GOULD & CURRY.—Alaska *Mining Record:* Mr. D. W. Walker, who has become interested in the lease and bond held on the Gould & Curry mine on Sheep creek together with Mr. John Brogan, returned to the Chilkat from a business trip below, where he purchased a pack train of eight horses. The animals will be shipped up on the next steamer, and will immediately be placed on the trail packing ore from the mine to the Silver Queen stamp mill. The Gould & Curry mine is one of the most promising gold properties in this section. The ore is comparatively free milling, and will average upwards of $30 to the ton in free gold. Enough development work has been done on the mine to show the veins to be permanent for a considerable depth at least, and altogether the indications are good for a rich little mine. It is situated near the summit of the range at the head of Sheep Creek Basin, and its inaccessibility has heretofore been the one damper to its operation years ago, but now with the improved and cheap tramway system, which are able to transport ore from the very clouds, over otherwise impassable gorges and precipices, and with men of energy to back such an enterprise, high-line claims can be worked just as advantageously and with as little expense as those lying lower down.

On the tramway leading to the Ground Hog mine in Silver Bow Basin, operated by the Nowell Gold Mining Company, the terminal stations are now lit up with arc electric lights. There are over 20 of these lights along the line, and they light up the steep mountain side and beetling crags with beautiful effect, and greatly facilitate the work of operating the tramway. The tramway is completed throughout and is now in operation conveying ore from the mine. It has a capacity of 200 tons per day of twenty-four hours, and operates smoothly and without a hitch. The mill will be started up some time during the week.

Superintendent Frank C. Hammond, of the Silver Queen mine at Sheep creek, has increased his force of men by ten, and thinks he will be able to operate the mill for two months more at least. On the last steamer the Queen shipped four tons of concentrates to the Tacoma smelter. Mr. Hammond states that the mine never looked better and was turning out rich ore. The mines of Sheep creek will prove to be a great bonanza to the country when they are systematically opened up and worked.

As soon as the mail boat arrives, the Rustler will leave for Berners Bay with the pile-driver in tow and a crew of men for its operation. It is supposed that the extensive improvements at that place will afford employment for a large number of men during the entire winter.

The air compressor and other machinery for the enlargement of the Berner's Bay Mining & Milling Co's plant at Berners Bay was placed aboard the schooner Onyx on Saturday for transportation to that place.

Work is progressing rapidly on the Bald Eagle mine at Sum Dum Bay, and the management are highly elated over past results. The mine still continues to turn out very rich ore.

Mr. Wm. Ebner is interested in a claim at Shuck Bay from which his two partners, F. Micho and Geo. Dakes, recently extracted some very rich gold ore.

On the down-going Topeka the Berners Bay Mining and Milling Co. shipped 57 tons of concentrates from the Comet mine to the Tacoma smelter.

Coast Industrial Notes.

—The coal mines of the State of Washington give employment to about 3000 men. Coal mining is one of the chief resources of the State.

—A gang of men are busily engaged in the preliminary work of building a new iron bridge for the V. & T. across the Truckee river at Reno.

—The steam wagons are hauling lumber from Foulks & Powning's mill, near Reno, to Verdi, making two trips per day and hauling 70,000 feet.

—J. H. Thies informs the *Journal* that a company has been organized at Lovelocks, to build a flouring mill. He has purchased 40,000 feet of lumber from the Verdi Mill and Lumber Company for the building. The mill will be of the capacity of fifty barrels per day. The latest improved machinery will be put in the mill. It is expected to have the mill in running order about New Year.

The contractors at the Government works at the locks near The Dalles, Or., expect to put 1000 men at work in a few days. It is reported that another electric-light plant will be put in operation, and gangs of men will be worked day and night. It appears to be the intention of completing the canal at the earliest possible date, and it is expected that boats will pass through the canal in the fall of 1895.

—There is a heavy business in copper, with steady prices, the greatest demand being for fine grades. Lake is quoted at 9⅝@9¾, but holders ask 10. Electrolytic, which was offered for 9¼ last week, now commands 9⅝@9¾. Arizona pig is selling at 8⅞@9, while casting brands are held at 9⅛@9¼. Exports are decreasing, but home consumption is rapidly increasing.

—The Carson *Appeal* says: Some time ago the *Appeal* stated that negotiations were pending between the Sierra Nevada Wood and Lumber Company and the Carson & Tahoe Lumber and Flume Company toward buying the former out. The other papers disputed this proposition, but now admit that the Tahoe company has purchased the wood and lumber interests of the other company.

—Leigh Harnett says: "I assert with the certainty born of a long and critical personal investigation that Oregon has whole mountains of marble of as absolute purity, fine texture and beautiful variegations as Italy ever produced. They exist in Wallowa, Douglas, Josephine and Jackson counties, and perhaps elsewhere. In all but the last county I have personally seen them. From these vast deposits I have gathered every variety except the absolutely 'antique green,' as it is called, but as this is the rarest of all known to the world, we can afford to let that go, as it is too costly for general use. In my travels through Oregon, I have found eight varieties, from pure black to pure white. When polished in San Francisco, these samples were pronounced equal if not superior to any foreign marbles in our market, especially the black and white. Of the purity of our Oregon marble, I may say a sample from Douglas county took the first prize for purity in the late World's Fair at Chicago. Such an award ought to satisfy the most skeptical."

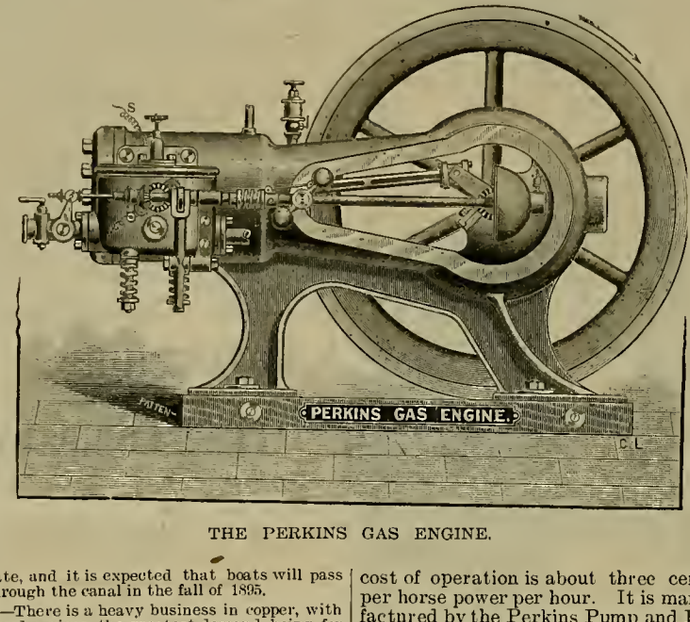
—A San Bernardino dispatch says that A. P. McGinnis, receiver of the Bear Valley Reservoir Company, left that city Saturday morning with a large force of men for Bear Valley lake. D. P. N. Little of Los Angeles has taken the contract to clear the reservoir of standing timber and debris, preparatory to the construction of a new dam next year. A Chicago, English and Scotch syndicate, on the 8th of October, will, at the public sale under the order of the court, buy out the entire plant, backed by a capital of $2,500,000. A new dam ninety feet high will be erected next season, and the canals, pipe lines and ditches will be built this winter. The new reservoir will contain five times the water of the old dam, or a continuous flow of 14,000 inches, with a holdover of the same amount for the next season. This will irrigate every foot of unoccupied land in the San Bernardino and Perris valleys. The new company propose to make a great summer resort of the lake region, and to operate car lines and works with electricity developed by water power at the dam site.

A Simple and Compact Gas Engine.

The accompanying illustration represents the new "Perkins" gas engine. As can be seen at a glance, the engine is both graceful and compact in design. Its claims to superiority cover several points, among which are perfect combustion of gas, cheapness and simplicity of operation, adjustable sparking device by which ignition of the gas is obtained at any point of revolution, easy to start, uniform motion, perfect lubrication of all parts, no vibration, etc.

Another important feature of this engine is that, by a simple exchange of mechanical attachments, it can be adapted to the use of common city gas, gasoline or kerosene oil.

Mechanical engineers say that for accessibility to wearing parts, economy of space, strength and durability, the "Perkins" engine has no equal. The



THE PERKINS GAS ENGINE.

cost of operation is about three cents per horse power per hour. It is manufactured by the Perkins Pump and Engine Co., 117 Main street, San Francisco. Those who contemplate the purchase of motive power for any purpose will do well to give this engine their consideration. An illustrated catalogue will be sent upon request.

Improved Steel Snatch Block.

Attention is called to the advertisement in another column of the "Harvey" Snatch Block. Though the block is in very general use, the cut accompanying the advertisement will enable those who are not already familiar with its construction to form some idea of its advantages over the ordinary kind. One of its chief claims to favor is the guiding ribs secured to the inner surface of the cheek plates, which cover the spaces between the sides of the pulley and the sides of the cheek plate, thus providing a smooth running channel for the cable, without the possibility of its becoming jammed, as is the case with the common block. Another strong feature is that the opening side of the block is a solid piece, easily manipulated under all conditions and giving added strength to the whole. Those who are interested can obtain a clearer idea of the many advantages of the "Harvey" Improved Steel Snatch Block by sending for an illustrated circular to the manufacturers, The California Stump Puller Co., 82-84 Zoe street, San Francisco, Cal.

Removal.

The Judson Dynamite and Powder Company has moved its office from No. 18 California street to No. 200 Market street, at the junction of Pine street.

TUBBS CORDAGE CO.
(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. ☞Extra sizes and lengths made to order on short notice

611 and 613 FRONT ST., San Francisco, Cal.

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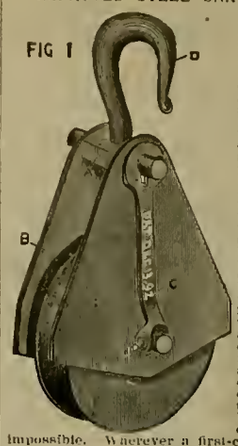

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Electrical Progress.

Electricity in War.

It is interesting to uote the important part played by electrical appliances in the war now being waged betweeu China and Japan. The Japanese, especially, are quick to turn to account any advantage offered by scientific appliances, and in Corea they have materially strengthened their hands by taking possession of the lines and stations of the telegraph service. Their men are trained in constructions as well as in actual manipulation, and can be trusted to keep the lines in working order as long as they retain control. The Mikado's people have taken very kindly to the telegraph since its introduction in 1870. Their first installation of a couple of short lines, about forty miles long altogether, speedily grew into 4000 miles, and now the wires devoted to the service measure close on 26,000 miles, including several submarine cables of various lengths, one of the longest being that connecting Nipon (the main island) with Tsu-shima, the large islaud midway between Japan and Corea, a position which, as may be readily imagined, is just now of the utmost strategical importance. So well, indeed, have these clever copyists appropriated and used the telegraphic developments of Western civilization, that there is now hardly a point on the coast more than a few hours distant from the telegraph office, so that a fleet runner could convey the news of a hostile descent to the adjacent outpost, and a defensive force be called to the threatened region in less time than it would take the Chinamen to determine upon their point of attack. This was demonstrated very clearly in 1876, when the news of the Satsuma rebellion was brought by a boatman to Kumamoto in one night and flashed to the capital almost before the insurgents' rear guard had cleared from Kagoshüna.

The consequence was that the rebel General Saigo was promptly met and snuffed out before he had reached territory in which his forces might have become dangerous through being augmented by nuuerous sympathizers. But for the telegraph there would doubtless have been serious trouble, for it would have taken a fortnight for a rumor to reach the capital, and the delay would have been all in favor of Saigo. Iu the matter of field telegraphy, too, the Japanese are adepts, their portable instruments, etc., being modeled upon apparatus which they have imported from Europe. The posts are made in sections, with spiked bases to stick in the soil, and the wire runs out from the reels on light handbarrows. The Japanese are entirely undisturbed by any considerations as to patent infringement. When the first telephone receiver reached Japan from America it was received with delight and enthusiasm, and within a week or so there were some Edison receivers of uative make being experimented upon. The police and fire brigade systems of telephonic alarms and calls now established in Japan are complete in every detail. Mauy of the Japanese vessels are furnished with the electric light, and it is stated that the manipulatiou of the projectors is remarkably efficient. Notice has been given that owing to the outbreak of the war, lights on the Formosa coast have been extinguished, and no doubt others, both in Japan and China, will also be put out, or false lights substituted, to suit the purpose of either. It will therefore be necessary for all steamers navigating those waters to be extremely careful, and a correspondent of a London daily suggests that one of the best precautions is to use the "submarine sentry," as by its aid a vessel going at ten knots can be assured that she has at least twenty fathoms of water under her keel, and warning is given ou board if less depth is reached, thus giving ample time for position to be verified. The "submarine sentry" is a recently invented electrical arrangement for giving the warning mentioned.

Interior Electric Lighting.

The importance of a thoroughly diffused light, if injury to the human eye is to be avoided, is a point apt to be overlooked in these days of electric and iucandescent gas illumination. Diffused lighting emanating from not too brilliant sources is better in every way than that which, though equal in absolute quantity, proceeds from intensely bright points. The paralyzing effect and ultimate injury to the eye produced by frequent exhibitions of powerful naked lights of any kind is a proof of this. All lights of great brilliancy should be placed above the ordinary line of vision and ought to be suitably shaded.

It is well known that by mixing two properly chosen spectrum colors white light can be formed, and the whiter the resultant light the more blue and violet there is in its spectrum. There is, therefore, a large quantity of blue and violet rays in the electric light. It has been shown that the well-marked color of light from an electric arc between carbon points is due to incandescence of the carbon vapor occupying the space between the two electrodes. This space constitutes the true arc, the space being filled with the carbon vapor, which has a brilliant violet color. It would be correct to say that the arc light is mainly an incandescent light, as the effect is produced by a layer of carbon being constantly evaporated at an extremely high temperature. Therefore the light of the carbon arc is not and cannot be white, although, as we have just mentioned, the very fact of violet being present iu large proportions gives it an apparent whiteness which is so delusive. The light is really violet-tinted owing to the carbon vapor usually present between the carbon poles.

Storage Battery Boats.

Of the 500 or 600 electric roads in this country, a large proportion reach natural or artificial waters, such as lakes or rivers, and in all parts of the country a large amount of work is now beiug done iu the utilization of the current from the trolley wires for charging storage battery boats to ply on these waters. The success of the World's Fair electric fleet, which carried without an accident 1,000,000 passengers on the lagoons and canals in Jackson Park, directed attention to the subject, and now the fleet is beiug dispersed to all points of the compass for kindred employment. It is pointed out that a street railway which will carry a passenger for an hour for five cents can easily earn from him five times as much for half au hour's trip on the water, with less expense. At Altoona, where an artificial lake of thirteen acres has been made, ten cents is paid by hundreds of delighted passengers for a trip around, lasting only seven minutes. Electrical boats are also being built now for regular ferriage, and a line is projected to ply between the smaller ports on the Gulf of Mexico. Some of the newer boats are of ample proportions, John Jacob Astor beiug the owner of one forty-six feet long.

If Soldiers Were Bullet-Proof.

If there is not some latent but fatal defect in Herr Dowe's system of making a soldier bullet-proof, the result of warfare will be a very remarkable one. Since the object of war is to kill, "to place *hors de combat*" is only a less crude way of putting the fact that new ways of killing infantry and cavalry will have to be devised. The chances of hitting men in the face at long distances with rifle fire will not be good enough. But the only ways of killing effectively that will remain open will be artillery fire, close combat with the bayonet and clubbed rifle, preferably the latter, as the cuirass will make the bayonet difficult to use with effect, and riding men down by cavalry charges. The first of these—artillery fire—has hitherto been regarded as of comparatively little importauce in the matter of killing. It is ofteu declared, indeed, that the chief effect produced by guns is the moral effect. Though not many are killed, men do not like to be within range of artillery. Possibly, however, the effect of artillery fire could be increased. In any case, and since everything is relative, the fact of the falling off of efficiency in rifle fire must increase the importance of artillery fire. It is obvious, however, that the chief effect of bullet-proof soldiers on the circumstances of a battle would be to increase enormously the amount of hand-to-hand fighting. But hand-to-hand fighting means an advantage to the strongest and most athletic force. Now, it will be seen from the bare enumeration of the changes which seem likely to follow bullet-proof soldiers, that a great advantage will be given to England.

Bullet-proof cuirasses will give an advautage to the nation which can only bring a small number of troops into the field. But that nation is England. It will increase the importance of artillery. But this should be in favor of England, for, though we have not the conscription, and so cannot get men in large quantities, we can manufacture as many guns as we choose. Next, the revival of close combat ought to be in our favor, for Englishmen are certainly better at the rough-and-tumble of close fighting than their neighbors. The infantry are naturally more handy and more athletic, and the cavalry are, if not theoretically better riders, more capable horsemen. An Englishman is more likely to get his horse to do the impossible than a Frenchman or a German.—English Ex.

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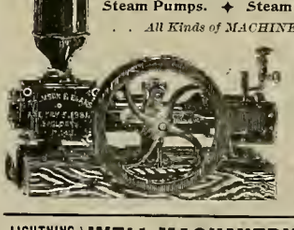
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Practical Information.

A Gun Manufactory in China.

Frank G. Carpenter, the noted traveler, in a recent letter from Shanghai, China, describes the government establishment for the manufacture of arms and munitions of war. Of the 2000 men here employed, only two are foreigners, and they are consulting engineers. At these works a number of twelve-inch guns have just been completed, and improved patterns of Armstrong rapid-firing guns are being made. In regard to the mechanical abilities of the Chinese workmen, Mr. Carpenter says:

Some of them are so expert that only general directions and the knowledge of the results required need be given them, and they will straightway make the designs and castings. I was shown one machine—I think it was for the rifling of some of the guns, though I am not sure as to this—which contained a screw of only three inches in diameter and thirty-five feet long, which was designed and cut by a Chinaman, and I took a time exposure of a yellow-faced Chinaman who makes the finest of the improved sights of the Armstrong guns. The work is as delicate and as beautiful as that of a watchmaker, and there is an improvement on the original, which this man has added. The rifling machine for the big guns would have cost $15,000 to import.

These Chinamen were shown drawings, and they made it for half that sum. It is so in nearly every variety of machinery, and among the things now actually being made in these works are all sorts of modern projectiles, from the revolver bullet up to great shots of steel weighing 1000 pounds. The steel works of this arsenal cover about four acres. The men are now experimenting in making ingots for armor plate, such as we turn out at Homestead, and they are putting in a steel furnace which will smelt fifteen tons of steel at one time. If it is a success they will add others. They have made some small ingots, and I saw steel rails for railroads which they turned out the other day to show the Chinese authorities that they could make them. They do all sorts of forging. They are now putting in a 700-ton steel press, which will exert a force of 2000 tons on the ore beneath it.

Up to this time China has been importing the raw material for her arsenals, but she is now experimenting with her own supplies, and the manufacturing China of the future will probably be entirely independent of the rest of the world. The coal and iron formations of the province of China are said to be the largest in the world, and the product is unsurpassed. The iron now used here comes from the province of Hunan, in about the center of China, and some idea of its character may be learned from a test which was recently made here. A shot was cast from this iron for a three-inch rifle, and it was fired against a target with the same charge and the same gun in competition with imported shot of steel.

The target consisted of three iron plates an inch thick, interleaved with boards of wood. The steel shots penetrated the target, but none of them went through it. The Chinese cast-iron shot passed clear through the target and was lost. The process of manufacture of the iron is not known at the arsenal, as it is shipped there in billets. The Chinese workmen excel in the manufacture of cast iron articles, as they make iron castings as large as an ordinary washtub, and have them only one-sixteenth of an inch thick.

Teaching Blind Girls to Cook.

A blind cook would seem to be an anomaly, yet Supt. Lyman Pease, of the Wisconsin School for the Blind, at Janesville, has of late demonstrated that blind girls cannot only be taught to prepare food in an appetizing way and by scientific methods, but they can also be taught the care and management of a stove and the use of kitchen utensils. A course in housekeeping has been one of the features of the school for some time, but cooking lessons have only recently been added to it. This was done not to make professional cooks of the girls, but because Mr. Pease, realizing how difficult it is to secure profitable employment for blind girls, thought it wise to teach them to be valuable assistants either in the kitchen of their own homes or in those of their friends. The girls use a wood stove instead of a gas or hard coal range, and, instead of having hot water boilers, they are required to keep the kettle filled and hot, as country housewives must. They are also taught to be exquisitely clean, and whenever they touch the stove or anything else that may soil the hands, they are obliged to wash them before going on with their culinary work. Knowing that the stove is a dangerous element in a kitchen where a blind girl is at work, particular attention has been paid to it in the course of lessons. The stove is not protected with guards, and the girls are required to learn by close attention and practice how to avoid any danger when making fires or working over the stove.—Milwaukee Journal.

Drying Mercury.

When mercury has been used in physical experiments or in gas analysis, says the *Scientific American*, it often becomes dirty and wet. If it becomes contaminated with zinc or lead, prolonged treatment with dilute nitric acid may be required to purify it. Washing with water has to be resorted to in such cases as these to remove all soluble impurities. Often in experimental work it gets wet with pure water. The drying of mercury in such cases is quite troublesome, unless time can be given to it. Where time is at the experimenter's disposal, the use of porous battery cups is highly to be recommended. The wet mercury is poured into one of these and is shaken about a little and left standing. The porous cup absorbs the water by capillarity, and it evaporates. In a few hours the mercury is perfectly dry. If no porous cup is at hand, the wet mercury may be poured into a tumbler and one or two pieces of thick blotting paper are thrust down between the mercury and the glass, so that several inches project above its surface. These act as described, absorbing by capillarity the water. This evaporates from the paper above the mercury. The meniscus of the metal tends to cause the water to settle down against the sides of the porous cup or against the paper, when it is at once absorbed.

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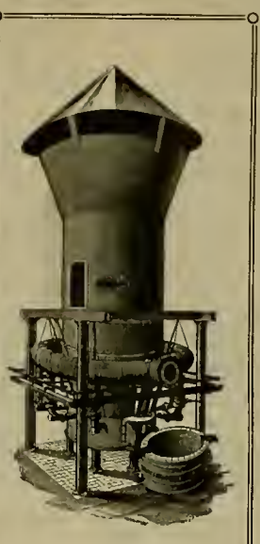

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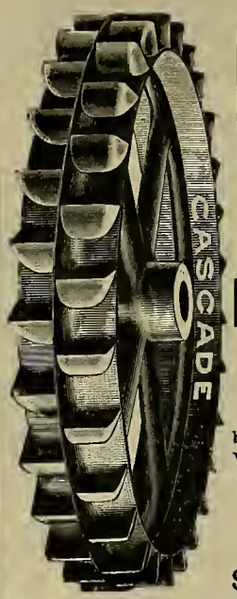

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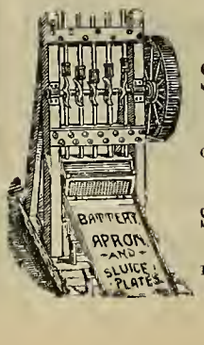

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Market Reports.

The Markets.

SAN FRANCISCO, Oct. 11, 1894.

No feature of the existing financial situation in all the principal commercial countries attracts greater attention than what is usually described as the glut of money. *Bradstreet's* reports that, as compared with this time a year ago, the Bank of England, for instance, holds specie to the amount of about $65,000,000 more than was in the vaults at this time last year. The reserves of the Bank of France are some $40,000,000 larger than in the autumn of 1893, and the increase in the holdings of the German Reichsbank are but little under that amount. The last report of the Associated Banks of New York displays an increase of $96,000,000 in cash reserves, and, in spite of the recent revival of demands for money, shows an idle surplus of nearly $60,000,000, while some $200,000,000 is lying useless in the Bank of England. Money, in short, is a drug; nor does the end of this situation seem to have been attained. The attempts, whether in London or New York, to institute a speculative movement which would furnish temporary employment for these accumulations have not thus far been successful, and developments of commercial activity and legitimate business in lines which, up to the moment, cannot be clearly foreseen, must furnish the outlet for all this unused and unproductive capital.

A statement issued by the Treasury Department, covering two-thirds of the month of September, shows that the customs receipts at the New York custom house for the first twenty days of this month amounted to $7,411,797, against $4,952,982 for the first twenty days of last month and $5,597,571 for the first twenty days of September, 1893. Still not one dollar of gold coin or gold certificates was received at the New York custom house during the first twenty days of September. The treasury gold reserve continues to grow slowly, however, and the fact that the receipts from importations are keeping up is naturally encouraging to the treasury officials.

Coin in the Sub-Treasury.

C. P. Berry, Assistant Treasurer of the United States at San Francisco, reports cash on hand in the Sub-Treasury at close of business on September 30, 1894, as follows:

United States Notes	$29,514.00
Treasury Notes, 1890	27,096.00
National Bank Notes	15,395.00
Gold Certificates	7,020.00
Silver Certificates	108,115.00
Gold Coin	11,283,031.00
Standard Silver Dollars	24,533,269.00
Subsidiary Silver Coin	124,871.45
Minor Coin	20,432.34
Total	$36,158,743.79
Standard Dollars shipped in Sept.	$232,000.00
Fractional Coin shipped in Sept.	136,920.00
Total shipments	$368,920.00

New York Prices.

NEW YORK, Oct. 11.—Followiug are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	.29	63	....	....	....
Friday	.29¼	63¼	9 25	3 15	19 25
Saturday	.29 5-16	63¾	9 30	3 16	....
Monday	.29 9-16	64⅛	....	....	....
Tuesday	.29⅝	63¾	9 40	3 18	19 10
Wednesday	.29 3-16	63½	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	12½c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63¾
Mexican Dollars, nominal	53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	11
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 55
Drop, B and *larger* sizes, "			1 75
Buck, Balls and Chilled, do, "			1 85
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	18
ZINC.			
Sheet	8¼	@	9
COAL. SPOT FROM YARD—PER TON.			
Wellington			$ 7 75
Greta			7 50
Nanaimo			6 25
Hilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			9 50
Wallsend			7 00
Scotch Splint			7 00
Brymbo			7 50
West Hartley			7 75
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Spint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Oct. 11, 1894.

The market has not been as active for the past few days as it was last week. Transactions have been rather light, and no very marked fluctuations have occurred. Advices received yesterday report a fine showing in the winze below the 1700 level of the Con. Cal. & Va. It is also reported that there has been an increase of eighty men in the working force of the Gold Hill mines, fifty of whom have been put at work in the Crown Point and thirty in the Belcher, extracting ore.

The report from the Morgan mill for the month of September is as follows: The mill was in operation fifteen days, and during that time 1586 tons of ore were crushed, yielding bullion of the gross assay value of $83,879.60, of which $38,163.72 was gold and $45,715.88 was silver. The average yield of the ore in bullion per ton was $52.87, and the average assay value of the ore per battery samples was $59.24 per ton. The average assay value of the ore per railroad car samples was $57.89 per ton.

The following illustrates the changes of the week:

MINES.	4	11
Alpha	$ 20	$ 12
Alta Consolidated	19	15
Andes	76	58
Belcher	97	75
Best & Belcher	1 75	1 35
Bodie	1 80	1 25
Bullion	40	36
Challenge	62	53
Chollar	75	65
Confidence	1 60	1 15
Consolidated California and Virginia	5 ⅞	4 90
Consolidated New York		
Crown Point	1 05	80
Exchequer		
Gould & Curry	1 05	74
Hale & Norcross	1 15	90
Justice	28	22
Mexican	1 75	1 30
Ophir	3 95	2 90
Overman	33	23
Potosi	90	81
Savage	87	69
Sierra Nevada	1 40	1 00
Union	1 00	81
Utah	08	8
Yellow Jacket	1 20	84

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 11, 1894.

FIRST SESSION—9:30 A. M.

200 Belcher	73	100 Justice	22
200	74	200 L. Wash.	2c
100	75	350 Mexican	1 30
300 Best & Belcher	1 30	300	1 25
100	1 35	900 Ophir	2 90
300 Bodie	1 25	200 Overman	21
200 Buiwer	12	400 Potosi	71
150 Challenge	53	200	72
100 Chollar	64	400 Savage	67
200	63	200	68
850 C. C. & Va	4 90	500 Seg Belcher	16
200	4 85	100 Sierra Nevada	1 00
100	4 80	100	99
250 Confidence	1 15	350	97
700 Crown Point	80	200 Silver Hill	05
550	78	450 Union	80
300 Gould & Curry	74	100	81
50	73	600 Yellow Jacket	84
400 Hale & Norcross	88	50	83
1000	87		

SECOND SESSION—2:30 P. M.

450 Ophir	2 70	100 Alpha	12
200	2 65	700 Belcher	73
100 Mexican	1 25	350 Sierra Nevada	99
100 G & C	71	200	1 00
100	72	600 Utah	8
300 Best & Belcher	1 30	400 Bullion	35
50	1 25	1000	36
950 Con Cal & Va	4 75	100 Seg Belcher	17
150	4 80	100 Overman	23
200 Savage	69	500	24
500 Chollar	65	150 Justice	21
650 Potosi	80	400 Union	81
200	81	300 Challenge	51
1400 Hale & Norcross	89	200 Bodie	1 25
200	90	300 Buiwer	10
200 Crown Point	78	200 Alta	15
150 Yellow Jacket	83	800	14
250	84	200 Andes	58
200 Kentuck	85	00	57

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 2, 1894.

526,675.—EARTH SCRAPER—A. F. Beruard, San Luis Obispo, Cal.

526,676.—WHEELED SCRAPER—A. F. Bernard, San Luis Obispo, Cal.

526,677.—WHEELED SCRAPER—A. F. Bernard, San Luis Obispo, Cal.

527,011.—MORTISE LOCK—F. P. Burkhardt, Chelan, Wash.

526,969.—REFRIGERATOR CAR—C. S. Hardy, San Diego, Cal.

526,837.—GAS ENGINE—C. F. Hirsch, S. F.

526,972.—CHILD'S CARRIAGE—J. W. Jaimisou, Vallejo, Cal.

526,924.—DOOR BOLT—Jochmus & Boughton, Monterey, Cal.

526,925.—CAN MACHINE—Johusou & Black, Oakland, Cal.

526,787.—CHECK BOOK—Middlekauff & Aiken, S. F.

526,954.—RAILWAY JOINT BRIDGE—C. C. Wells, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

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MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12, Oct 17, Nov 7	J E Jacobus, 309 Montgomery
Bay State M & D Co, Cal	22	3c	Aug 25, Sept 29, Oct 24	F E Luty, 330 Pine
Belcher M Co, Nev	49	25c	Sept 14, Oct 18, Nov 8	C L Perkins
Brunswick Con G M Co, Cal	7	2c	Aug 22, Sept 25, Oct 11	J Stadtfeld, Jr, 309 Montgomery
Gold Hill M Co, Nev	47	10c	Sept 13, ... Oct 17	J E Jacobus, 309 Montgomery
Golden Eagle M Co, Nev	1	15c	Sept 15, Oct 16, Nov 5	E B Holmes, 309 Montgomery
Lady Washing'n Con M Co, Nev	10	5c	Oct 5, ... Nov 9	J E Jacobus, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3, Nov 8, Dec 3	J W Pew, 310 Pine
Ophir S M Co, Nev	63	25c	Sept 5, Oct 9, Oct 29	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	12	30c	Sept 4, Oct 15, Nov 12	J W Pew, 310 Pine
South Eureka M Co, Cal	14	1c	Sept 20, ... Oct 29	A Haisey, 320 Montgomery
Utah Con M Co, Nev	20	5c	Sept 28, Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3		Sept 27, ... Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Carson Creek M Co, Nev	A K Durbrow, 309 Montgomery	Oct 15
Con Cal & Va M Co, Nev	A W Havens, 58 Nevada Block	Oct 15
Eureka Con M Co, Nev	H P Bush, 134 Market	Oct 15
Exchequer M Co, Cal	C E Elliott, 79 Nevada Block	Oct 15
Mayflower G M Co, Cal	D M Kent, 330 Pine	Oct 15

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TAP OR FAUCET.—M. P. Schetzel, San Francisco. No. 526,327. Dated Sept. 18, 1894. The object of this invention is to provide a simple closing device for casks containing beer or other liquids, with an insertible, removable bushing, and a valve so closed, with relatiou to the bushing, as to allow the interior of the cask to be pitched without removing the bushing and valve, and, at the same time, to prevent any obstruction to the opening of the valve afterwards. It consists of a bushing adapted to be secured in a cask having a cylindrical outer chamber; an inner chamber of smaller diameter forming a shoulder between the two for the receptiou of an elastic washer; an interiorly projecting flange surrounding the inner chamber midway of its length; elastic washers seated upon opposite sides of said flange; a disk valve fitting the inner eud of the bushing and forming a seat upon the end of the bushing; a central stem projecting inwardly from the valve, having a cross fixed to its inner end which rests upon an elastic washer, so that the elasticity of the washer retains the valve normally closed; a faucet barrel having a longitudinally and diagonally connected slot formed in one side, adapted to move over a pin within the bushing, so that the turning of the faucet barrel in one direction will force the valve open, and, turning in the opposite direction, allows the elastic washer to close it.

SASH FASTENER.—James Seadler, Sacramento, Cal. No. 526,268. Dated Sept. 18, 1894. This invention relates to a check and lock for sliding sash screen, blind or other device, in which the weight and momentum of the moving appurtenances are utilized to operate upon the lock to hold it at any particular point, to prevent wrapping. It consists of a casing; a dog therein provided with a cam; a double-acting spring for holding the dog projected and retracted; a spindle for operating the dog; a chambered face-plate having an opening through which the spindle projects; a knob on the spindle; a toothed disk within the face-plate; a collar clamping the disk against the hub of the knob, and a sliding dog on the face-plate to engage the toothed disk and lock the spindle.

CURTAIN ATTACHMENT FOR WINDOWS.—J. M. Freeman, Oakland, Cal. No. 526,306. Dated Sept. 18, 1894. This invention relates to an attachment for windows for the support of curtains in such a manner that the curtain may either be moved with the sash or remaiu connected with the window frame, so that the sash may be moved independently of the curtain. It consists of a rod or sash from which the curtain is suspended, with plates upon which the ends of the shaft are journaled so as to be rotatable thereon, said plates having angular projections extending into channels between the window sash and the stop, so that they are slidable vertically and guided by the channels and hooks; and loops fixed respectively to the rod and shaft, so that the rod may be connected with the sash aud be movable up and down therewith or disengaged therefrom, to remain in position while the sash is moved independently.

EXPLOSIVE ENGINE.—Henry F. Fraser, Antioch, Cal. No. 526,348. Dated Sept. 18, 1894. This is a double acting explosive engine. It has a main cylinder with a single piston and an exhaust at each end. There is a compressiou cylinder at one side, having a single piston and an inlet for the charge at each end. The two cylinders communicate at each end by passages having valves. Betweeu the two cylinders are explosive chambers, exterior to both and located in the communicating passage. Within these chambers are the electrodes for affecting the explosion. These are normally separated and each is controlled by a spring. A pivoted lever has its free end adapted to contact with and withdraw one of the electrodes, whereby, upon said eleetrode being relieved, it will spring into contact with the opposing electrode and will be caused to instantly rebound and become normally separated therefrom.

HOISTING APPARATUS.—Louis Rosenfeld, New York. No. 526,263. Dated Sept. 18, 1894. The object of this apparatus is to hoist the load preliminarily to clear its immediate surroundings, and then to automatically and by the same continuous movement of the hoisting power hoist it outboard or sidewise to the point at which it can be dumped or lowered away. The apparatus consists of a support with guides located on each side, a double hoisting rope or cable directed from its bight to and by said guides and having its ends attached to the load receptacle, said cable or rope having in one of its sides an obstruction adapted to arrest the movement of that side at a predetermined point while the other side is still moving, and a hauling block in which the bight of the cable freely runs.

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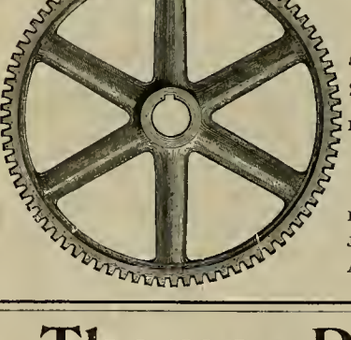
THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Messrs. J. S. Gould and F. M. Spencer in the Holloway mine, near Gibsonville, Plumas Co., Cal., and to impound tailings behind log and brush dam in a ravine below the mine; from W. A. Morse in the Mugginsville mine, near Eureka North, Sierra Co., to impound tailings behind a crib dam in Eureka creek; and from John R. Jones in the Waukshaw mine, near Relief Hill, Nevada Co., to impound tailings behind rock dam in Logan canyon, gives notice that a meeting will be held at Room 82, Flood building, San Francisco, Cal., on October 29th, 1894, at 1:30 P. M.



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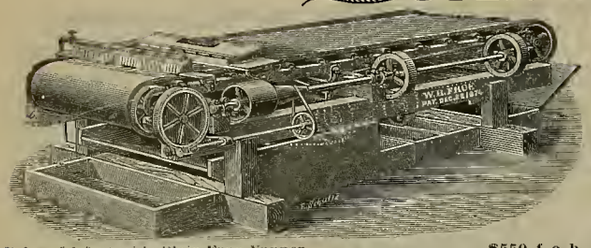

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GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.,
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.
C. J. CLARK, Gen'l Supt.

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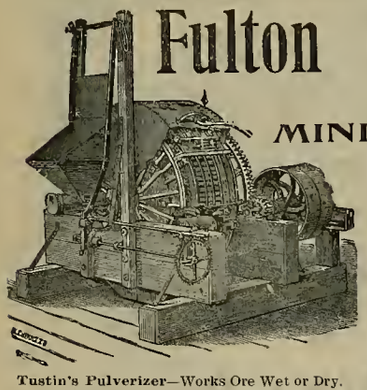

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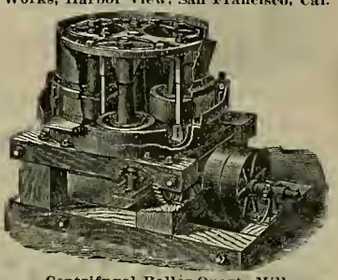

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AND PACIFIC ELECTRICAL REVIEW.

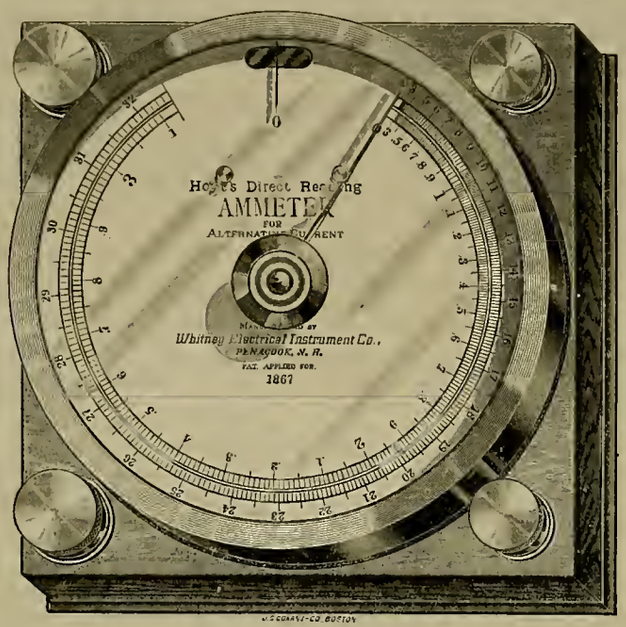
VOLUME LXIX. Number 16. SAN FRANCISCO, SATURDAY, OCTOBER 20, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Hoyt Ammeter.

Since alternating currents have come so generally into use for lighting purposes, electrical instrument manufacturers have been at work trying to devise accurate measuring instruments. The efforts of the Whitney Electrical Instrument Company have been crowned with success and they are now placing upon the market an instrument absolutely correct and reliable in every respect. One of the principal features of the above instrument is its adaptability to the reading of high or low currents. Lighting companies have long needed an instrument to take single lamp measurements. With the Hoyt ammeter they are readable to one one-thousandth of an ampere. This type of instrument is operated similar to the dynamometer but is direct reading, thus doing away with the necessary tables. It is on the principle of a balance, the armature acting against a double spring torsion.

A brief description of the method of taking the readiugs may be of interest.

The armature needle and index-pointer should stand at zero when the instrument is not in circuit. When the current to be measured is passed through the instrument there will be a deflection of the armature ueedle. To obtain a reading, turn the index-pointer until the armature needle is brought to zero, when the value will be indicated upon the scale by the index-pointer. These instruments may be seen at the California Electrical Works, No. 35 Market street. This house is the Whitney Electrical Instrument Company's agent for this coast.



THE HOYT AMMETER.

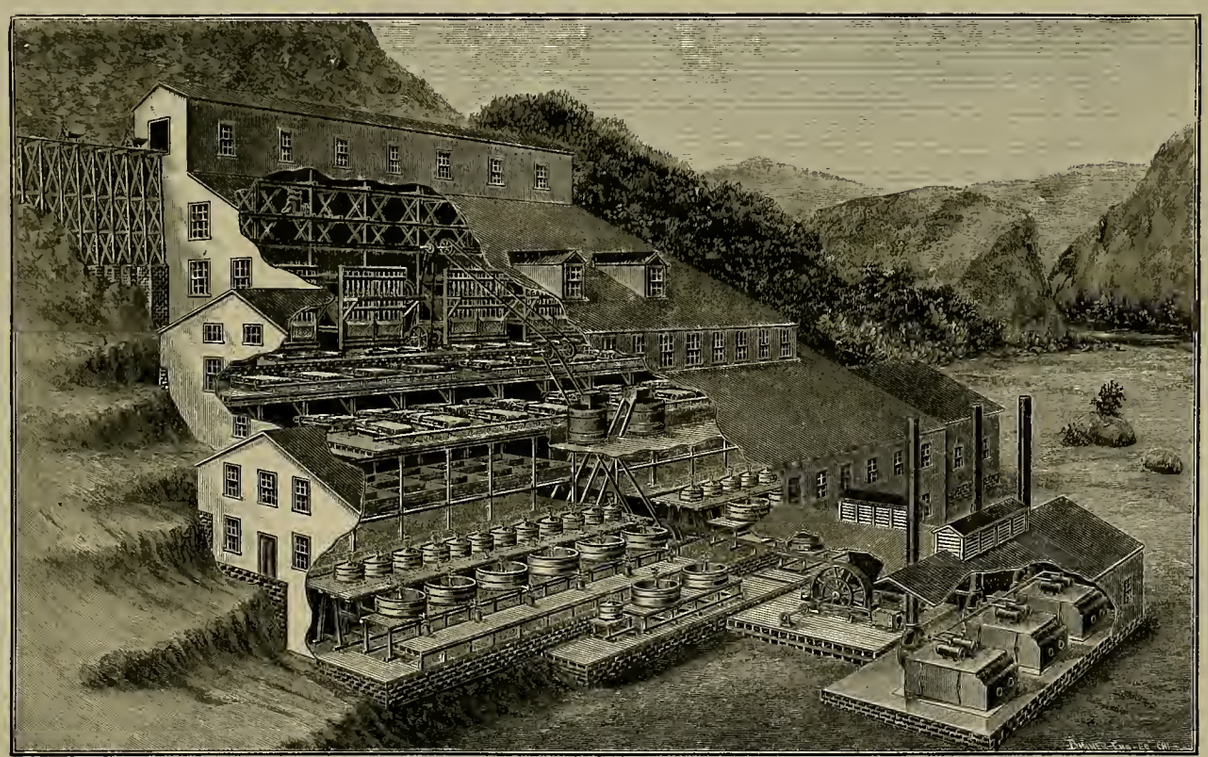
ST. PAUL, Minn., capitalists have purchased the Eagle, the Lane and other black-sand mines, near Coquille, Ogn., for a total of $70,000. These are all old claims which have been worked intermittently for years. A mill and other improvements, costing in the aggregate about $100,000, will be erected on the premises near the river, and work will be prosecuted at once and employment will be given to a large number of people. It is said careful tests of the sand have been made from time to time for more than a year past, and that the principal object of the work is not to get the gold but other metals in the sand, although the gold will be taken in. This will uudoubtedly stimulate matters and give a new impetus to black-sand mining in that section.

A Fine Combination Mill.

The accompanying plate illustrates a plant recently erected on the property of the Eureka Hill Company. at Eureka. Utah, and is described in the Salt Lake *Tribune* as the "best combination mill in the world." The structure rests on the hillside above the hoisting works of the mine, in eight benches or steps. Only on one of the benches was it deemed importaut to put in a retaining wall, and that was largely precautionary, because it was thought that the vibrations from forty stamps might possibly in time weaken this point, and hence a wall so solid that it cannot be shaken was placed there.

The visitor, of course, first reaches the boiler room, a large structure containing three separate uests of boilers of two each, so arranged as to use only part at any one time. Back of this are the large coal buuk ers, to be filled by means of a tramway extending from the railway below. Next, of course, comes the engine room, 40x40 feet, ceiled throughout, and which will be as neat as a parlor. The engine, of 350-horse power, is a compound, the high-pressure cylinder being 22x48 inches and the low-pressure cylinder 32x48 inches, with arrangements for condensing when desirable to do so. The twenty-foot diameter wheel, weighing 39,000 pounds, has eleven grooves for ropes, which will carry power to the line of shafting which is to drive all the machinery at the mill. In the engine room are the dynamos to generate electricity for lighting, etc. From the boiler room upwards extends the building a distance of 240 feet, with a rise from bottom below to top of ore house of 144 feet, while the building is 180 feet across in the other direction, making a very large structure. Still above this is the salt house. In operation, ore will be hauled to the highest part of the mill by means of double tramway, extending from the mine hoist 850 feet, with a rise of about 300

(*Continued on page 244.*)



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MINING AND SCIENTIFIC PRESS.

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Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, October 20, 1894.

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THE first pure copper ever sent from Utah was shipped last week to Chicago and Pittsburg. The amount was 61,832 pounds, and is the first product of the new copper plant. Of copper matte the shipments last week were 130,950 pounds.

THE placer gold fields of the Cape Horn country seem to be identical in nature with the ocean-beach sand diggings of the California coast. The gold is all found in the black sand in small particles, and the patches along the beach are soon worked out. The men wait for bad weather and a heavy surf, after which fresh layers of black sand bearing gold are found. No settlements have sprung up on the shores of Tierra del Fuego, as the diggings are soon exhausted and the men move from beach to beach.

Notice of Good Faith.

It will be remembered that in July last Congress passed a bill suspending for the year 1894 the provisions of the Revised Statutes which require that $100 worth of labor per annum shall be performed or improvements made on mining claims.

By filing with the proper recorder a notice that the claimant intends to hold and work his claim in good faith he is exempted from the annual assessment work this year. This "notice of good faith" virtually takes the place of the assessment work, but it must be given in writing and filed before the end of 1894. Those who neglect to make and file the notice endanger the title to their claims.

The California Miners' Association, through its Secretary, Mr. Wm. C. Ralston of this city, has issued a blank form of this notice, which is in compliance with the law and is as follows:

NOTICE OF GOOD FAITH.

Notice is hereby given that the undersigned owner.. of —— certain mining claim or location— known as and called the ——, situated in the —— Mining District, in the county of ——, State of ——, being desirous of taking the benefit of the Act of Congress entitled "An Act to amend Section numbered Twenty-three Hundred and Twenty-four of the Revised Statutes of the United States relating to Mining Claims," approved July 18, 1894, hereby declare.. that —— in good faith intend.. to hold and work said claim...

Dated —— A. D. 1894.

It is a very simple matter to make out and sign this form and file it with the district recorder or recorder of the county in which the mine is situated, and the mine owner is thereupon released from doing the assessment work. But as stated, the filing of such a notice is requisite and should be promptly attended to by all claim owners.

California Gold Mines.

Reports from Arizona, Colorado, Montana, Oregon and other mining sections all indicate a material increase of the gold product this year over that of 1893. This was only to be expected when so many miners had to give up operating in silver and turn their attention to prospecting for and developing gold properties. It shows, too, that the injection of capital into this branch of the mining industry was all that was needed to impart activity. Mine investors are not looking in these days for silver, silver-lead or copper claims, but they are all in search of gold.

Whatever may be the claims of other States with respect to their gold output, none of them have ever yet been able to equal that of California—the Golden State. Ever since the discovery at Sutter's mill, this State has led all others in the production of the yellow metal, and it so continues to-day. The close of the present year will show the same comparative record, as, while others are increasing their output, California is doing the same. It has the advantage of by far the most extended gold fields in the United States, and the greatest variety of sources of gold. It is found to a greater or less degree in nearly all of the fifty-seven counties of the State. The mountain, valley and coast counties all yield it in some form.

Gold mines are worked in the extreme north, extreme south, in the high Sierras and on the coast. It is found in sections rich in agricultural resources, and upon the barren deserts. The glacier-crushed rocks of the mountain peaks and the sands of the ocean beach reward the search of the patient miner.

Gold is found in California, not only in the quartz rock, but in vast beds of gravel which underlie the old red hills, and which are only partially touched as yet. In quartz, hydraulic and drift mines, river bars, river benches, river beds, dry creeks, wet and dry placers, sea-beach sands, and in fact in whatever way gold is found, so it is found in California.

Some of the other States, and notably Colorado, have had the advantage of California in their abundance of capital in mining enterprise. And, moreover, the people there understand the advantage of advertising their mineral resources. In our own State the policy has generally been to keep very quiet indeed about the producing mines, and very little is made public concerning them. The greatest gold mine in the United States—the Utica of Calaveras county, California—is scarcely heard of publicly even here, much less outside our borders.

The reason for this seeming lack of enterprise is that our gold mines are never stock operations. The stocks of our gold mines are not sold in open market, and the stock exchanges know them not. The mines are owned and operated by individuals or private corporations, who keep their business to themselves. They have no reason to herald rich strikes or amount of product, and endeavor to conceal rather than publish the result of operations.

This may be a mistaken policy as far as the general advancement of the mining industry is concerned, but it is one long followed in this State. Even in the famous days of mining-stock excitements in San Francisco, when millions changed hands in a day, not more than a dozen of the gold mines of this State were dealt in at the stock exchange. The transactions were all in silver stocks. When the brokers not long since offered to list gold properties free at the stock exchange, there were not more than half a dozen mines which took advantage of the opportunity. From this it will be seen that our gold mining in California is conducted rather as a legitimate business proposition than as a speculation. We have been in this branch of the business so long that its details have been thoroughly mastered, and all the economies are recognized and practiced.

While there are very many developed gold mines, there are yet in this State thousands of prospects or undeveloped claims needing capital to make mines of them. People cannot come here and find the mine they want in a week, nor can they buy it for a song, but those with money to invest in gold mining, and who are looking for properties, can do better in California to-day than they can in any other State in the Union.

California Petroleum.

The recent strike of oil at Los Angeles emphasizes the growing importance of the petroleum industry of California. There are now about seventy wells in the Second-street district of that city, with an estimated output of 500 barrels a day. The largest output of any one well is thirty barrels per day, and the average about eight barrels. It is not at all likely that this is a mere local isolated deposit, but it is probably part of the oil belt which runs from Ventura county to Puente. The oil-bearing territory of the region is now being investigated, under the direction of J. J. Crawford, State Mineralogist, by Mr. W. L. Watts, field assistant of the State Mining Bureau, author of the recently published bulletin on the petroleum-bearing formation of the central valley of California.

There are several oil belts in this State, but the one most largely developed and the greatest in point of production is that beginning in Santa Barbara county and continuing through Ventura and Los Angeles counties. It is on this belt that the wells of Newhall, Los Angeles city and Puente are situated. The most important of the districts are the Santa Paula region, in which are found the Ojai, Sespe, Ex-Mission (which includes the Adams and other districts), the Torrey canyon in the San Fernando mountains, twenty-two miles west of Newhall, the San Fernando district, including the Pico, Wiley and Elsmere fields, and the Puente district, in which only one field, the Puente, is found. The wells in the Santa Paula sub-district of these southern fields are in Ventura county; the Puente and Pico districts are in Los Angeles county.

There is an oil field in Humboldt county, but practically no development has been made; and the same may be said of that in Kern county. Another field is in Santa Clara, San Mateo and Santa Cruz, extending along the coast into Monterey and San Luis Obispo, and thence over the Coast Range into Fresno and Kern counties. It will be seen that, though oil has been found in many other parts of the State, the fields where it is obtained in merchantable qualities are mainly confined to the southern counties.

The petroleum fields of California are the most interesting in the United States, differing, as they do in many respects, entirely from other fields yet opened. The oil, with the exception of that from Santa Clara, and one or two isolated wells, has usually as its base, asphaltum, instead of paraffine. The strata in which the oil is found are tilted at a high angle. Drilling is difficult and expensive, owing to the character of the rock and the angle at which the oil-bearing strata stand. The oil, while carrying but a small proportion of the illuminating hydrocarbons, finds a ready market as fuel, owing to the high price of coal here, and contains practically no sediment.

California now stands seventh among the list of oil producing States of the Union, being exceeded in annual product by Pennsylvania, Ohio, West Virginia, New York, Indiana and Colorado. In 1889 it was fourth in rank of production, but other States have exceeded it since. The production in this State last year was 470,179 barrels, valued at $608,092, which was larger than any year since 1888, when it was 695,333 barrels. The total production of this State since 1875 has been 4,769,450 barrels.

Our present production, however, is not sufficient to meet the demand for fuel, and considerable is brought from Peru. The addition of the product of the new oil field at Los Angeles city, while gratifying, can be readily consumed locally, no doubt, and will aid the manufacturing interests of that place. As petroleum becomes more abundant and cheaper, it will still more greatly take the place of coal as fuel, and an abundant supply is needed on this coast. The discoveries at Los Angeles will doubtless lead to further prospecting for oil in that and adjacent regions, where there is a good field for such operations. The discovery at this point is the most important thing which has happened in connection with the mineral history of California this year.

THE grub-staked miners who have been out in the hills all summer are now returning to the camps for the winter. They all have half a dozen or more prospects on which they will begin work in earnest in the spring.

Co-operative Mining.

Mr. Huntly, of the Morning mine, near Mullan, Idaho, has taken his workmen into partnership, in a measure, and there is considerable interest in seeing how the proposition will work. The mine is to be worked on the co-operative plan.

By the terms of the lease twenty-five per cent of the net proceeds of the ore or concentrates produced goes as a royalty to the Morning Mining and Milling Company, who will pay all taxes, insurance, legal expenses, Milwaukee office expenses, assessment work, and all special improvements, new buildings and mine development work. The remaining seventy-five per cent of the proceeds of ore or concentrates will be used as follows:

First—To pay the company $1300 monthly toward expenses of mine development. But the ore mined by the company in doing development work will not be kept separate, but go with the other without extra charge.

Second—To pay operating expenses of mill, railroad, office and general repairs to mill and railroad machinery.

Third—The remainder shall be divided among the lessee and the entire undergrouud, surface and tramway mine force in proportion to the number of days each has worked, and according to the class of labor to which each belongs. The division shall be so made that carmen, shovelers aud general surface laborers shall receive five-sixths as much per shift as a miner.

Blacksmiths, carpenters and head timbermen shall receive one aud one-sixth as much as miners per shift. Shift bosses shall receive one and one-half as much as miners. The foreman shall receive twice as much as miners. The manager and lessee shall receive two and one-half times as much as miners.

Provision is made that the mine shall not be "gouged," but shall he timbered, stoped and worked in the ordinary way. In the agreement there are arrangements for settling the amount due to men leaving or who may be discharged. Men can hoard and trade where they please. A committee of three on behalf of the men is to have facilities for inspecting the hooks. The men are required to sign an agreement releasing the lessee from claims for damage from iujuries, and also to accept as full pay their proportioned shares of the month's receipts.

For a fully developed mine that will pay steadily, this plau of Mr. Huntly's may work all right. It is doubtful, however, how far it would he carried out, unless operations were at once profitable. Men would not care to do much mere prospecting or developing work on such a hasis. Still, Mr. Huntly's experiment in starting up the mine again on this new system will be watched with interest.

A Great Tunnel Completed.

A notable piece of miuing work was brought to completion at Park City, Utah, last week after over six years of constant labor. This is the Ontario drain tunnel, which will drain the Ontario, Daly and Daly West mines, with which it has direct counection. It is expected that it will also reduce the water in the Silver King and other properties. The flow through the tunnel before its connectiou was made last week was about 13,000 gallons per miuute. As soon as the cleaning up is all done the great Cornish pump will he stopped, aud all the water will flow through the tunnel. The mines are capped at a depth of 1500 feet.

This tunnel is 15,490 feet long and it took six years and three months to run it. The average cutting per day was six aud three-fourths feet. The completion of this tunnel will effect an enormous reduction in the operating expenses of the mines. The great Cornish pumpiug plant, which represents an outlay of nearly $500,000, will now he stopped, and no fuel will be required except for hoisting. It is estimated that the cost of ore production will be reduced about $5 per ton. On the basis of last year's production—56,000 tons from the Ontario and Daly—this would effect a saving of $280,000 and the tunnel would more than pay for itself in two years. Add to this saving the amount that has been expended yearly in the tunnel and it will be seen that the mines will be in a position to resume dividends. The mines will continue to be worked notwithstanding the low price of silver.

Concentrates.

THE Red Rover mine, at Acton, is working twelve men.

THE plant at the Good Hope miae, Perris, is to he increased.

THE Zirn claim at Pine Nut, Nev., is producing considerable gold.

Two gasoline hoists are in operation ia Pinacate district, in southern California.

BRITISH COLUMBIA wants a Mining Bureau so as to advertise its mining resources.

THE Homestake mine, in the Black Hills, has eight year's supply of ore for its mill in sight.

CRIPPLE CREEK, Colorado's best gold camp, is turning out over half a million dollars a month.

SOME forty claims have been taken up for "quicksilver" a few miles west of Perris, Riverside county.

A PYRITIC smelter is to be erected at Kennedy, Nev.; the site has been selected opposite the Imperial mill.

THE Morning Star gravel mine of Iowa Hill, Placer county, has declared its forty-sixth dividend of $1.50 per share.

IF the work now intended is carried out, there will be 250 more stamps next summer in the vicinity of Juneau, Alaska.

SOME of the principal owners of the Mercur mine, Utah, are negotiating for a gold property in Siskiyou county, this State.

MONTANA papers claim that the product of gold from that State this year will he seventy-five per cent over that of 1893.

THE Needles Reduction Works have been attached for $28,000 by the Nevada Bank of San Francisco. The mill has been idle for several months.

MINING ASSESSMENTS delinquent this month amount to $136,000, of which Nevada mines call for $102,000, California mines $4000 and Arizona mines $30,000.

CHLORIDERS in and around the Julian and Banner districts, San Diego Co., are keeping twenty stamps in two custom mills dropping on ore averaging from ten to forty dollars per ton.

AT Ogilby district, San Diego county, water is pumped from the Colorado river, twelve miles distant. The Golden Cross mine has a large body of ore, which is quarried out, and is paying well.

MANDERVILLE & RICHARD are running a tunnel to tap a channel about a mile northwest of the Metcalf mill, near Nelson Point, Plumas Co. It will require about 350 feet of tunnel to do the work.

ADVICES from Cooks Inlet, Alaska, indicate an increased output of gold from the heach sands in that vicinity. There are also rumors that another stamp mill will be erected there the coming summer.

HENRY COOK, of the Silver Cloud mine, Dragoon mountains, A. T., has ordered a one-stamp mill for use in crushing the ore and a horse-power to run it. He expects to crush two tons per day with the mill, which he can concentrate.

A GUTTENBURG mill has lately been put in at the Golden Rule quartz mine on Horseshoe Bar, south of Newcastle, Placer Co. A 300-foot drift has been run, twelve men are employed, and the rock is being milled with good results.

T. P. MOUNTER, formerly of Sierra City, has been appointed at the Nevada City mine, at Nevada City, to take the place of T. J. Benney, who has been appointed superintendent of the Contact mine, otherwise known as the Live Yankee.

THE gold mines at Deep Creek, Utah, are operated very slowly, as they are so far from railroad connections at present that costs are quite heavy. There is also great scarcity of water. There are five mills, but only water enough for three.

CAPTAIN MILES STANDISH of Salt Lake has purchased the Placer Basin group near Seven Devils, Washington county, Idahe, for $150,000. The property consists of four quartz claims owned hy E. M. Barton, J. A. Dimick and Harry Siskrow.

T. A. STARRH, lessee of the Star mine, Wood River, Idaho, has made a good strike in the lowest working level of the mine. The vein showed eleven inches of solid galena, judged hy miners working there to he worth hetween $300 and $500 per ton.

DURING the month of Septemher the price of copper advauced nearly half a cent per pound, aud the market closed firm at the advance. Exports were somewhat larger than in August; production about the same, while home consumption is considered good.

THE Mercur Mining Co. of Utah are making extensive improvements at their mill. The machinery for the new mill and the more extensive leaching tanks are in the East ready for shipment, as soon as the company finds that it will be in shape to put them up.

MR. GRAY, superintendent of the Gladstoue mine, French Guleh, Shasta Co., is trying to settle up the affairs of the company. The Union Iron Works put on the last attachment. It is said that the stockholders have decided to start the mill and mine again.

EVERY report from the South African gold fields is to the effect that so far as concerniug men who work for wages, that country is a poor place for white men. Native labor is so very cheap, and many men who have gone to South Africa in search of work at living wages are reported destitute and desirous of getting away.

SOME of the largest gold nuggets ever sold to the Citizens' Bank were hrought to Nevada City the other day. The lumps were irregular in shape and varied in size, some of them heing over two inches long and a half-inch thick. There were over $300 worth of the nuggets and they were taken from a gravel mine above Washington.

IT is estimated that the act of Congress, suspending for the years 1893 and 1894 the clause in the United States mining statutes requiring $100 worth of labor to be performed annually on unpatented mining locations, has resulted in a saving of more than $10,000,000 to the owners of such claims in the various silver-producing States and Territories.

THE superintendent's report of the Homestako mine, Black Hills, for the fiscal year ending Juue 1, 1894, shows the total net proceeds to have been $1,489,961.18. Of this, $1,372,669.35 was from hullion, $17,944.27 from concentrates and $99,350.56 from ether sources. The dishursements aggregate $1,162,744.55. Of this amount, $811,499.63 was paid out for labor and $181,250 in dividends to the stockholders. For the purchase of mining properties during the year $103,780 was expended. The item of taxes foots up $20,012.74, $7,403.25 represents the cost of candles, while the item of powder foots up $38,879.07. The company started the new year with the comfortable balance of $327,216.63 cash on hand.

AT the annual meeting of the Mayflower Gravel Mining Co. of Placer county, the following officers were elected: F. Chappelet, president; H. F. Green, vice-president, and Chas. Mayne. F. W. Zeile and H. Bendel, directors. D. M. Kent was re-elected secretary. A dividend of ten cents a share was declared and the annual statement shows a credit of $29,000.

ADVICES from New York say that the sale of the Lost Confidence mine at Iron Mountain, Shasta Co., is an assured fact. Immense reduction works, having a capacity of 4000 tons per day, will be erected near Copley, and seven miles of narrow gauge track will connect the mine with the railroad. Although the distance is but three miles the grade will be 350 feet to the mile.

THE board of directors of the Bullion-Beck Mining Company of Utah held a meeting and by unanimous vote rejected a proposition from the Almo Mining Company to compromise the suit recently instituted by it, praying judgment in the sum of $100,000. The Almo Company's claim is that its lines have been invaded and ore of the value of $100,000 mined from it. The Bullion-Beck people deny this.

THE Dayton *Times* says that the Ninety-Four Company of Dayton has put up a horse-power hoisting apparatus for the power of raising the gravel from their shaft. This will enable the company to handle the material more rapidly than hoisting by band. The company has taken hold of a lot more placer ground that has been lying idle for many years and is making wages out of it now for eight or ten men.

THE rich find of mineral at Salina, Levier Co., Utah, is attracting considerable attention, though some are inclined to be skeptical concerning it. A great many claims have been taken up, and the locators are sanguine of good results. The ore is in sandstone, in the shape of carbonates, and is very rich in copper and lead, with a small per cent of silver. Of course this is only what the surface croppings indicate, and to get at the direct proposition much development work must be done. There are many who think that Salina is on the eve of a great awakening, and that another Silver Reef has been discovered. The discoveries are four miles east of Salina, near the mouth of Soldier canyon.

ANOTHER factor in the prosperity of the town is the cyanide process of working tailings. The plant put up by the Standard for this purpose is going right ahead with its work, and the results are said to be entirely satisfactory. A conservative estimate would place the amount of available tailings in the town at 100,000 tons, and an average valae of $5 per ton would not be a high figure. If, as is claimed, an extraction of from 80 to 90 per cent can be obtained by the cyanide process, it can he readily seen that there is a lot of money in these tailings alone. The Standard tailings mill has a capacity of 100 tons daily. J. S. Cain, A. J. McCone and A. Soderling, who own between 40,000 and 50,000 tons of tailings on Booker Flat, will probably put up a plant to work them next spring.—Bodie Miner.

JOHN MCCUSH, Billy Bughee, George Martin, O. E. Nash and Wm. Jackson are interested in a gravel prospect across the river from Redding, on land owned by Martin, and just above the Hudson & Martin ranch. For some time McCush and Bugbee have been pushing a tunnel through cement and sandstone, and are now in 175 feet, and making an upraise to an old shaft. There is known to be an old river channel heneath the lava formation on top, and gravel in the shaft prospects a cent to the pan. It is expected that after making twenty-five to thirty feet on their upraise they will strike this hed of gravel. Just how deep it is is not known, but once in the river channel it is hoped that good pay can be had by drifting. A short time will demonstrate how good the prospect is.—Redding Free Press.

Personal.

J. A. AND A. S. CAMERON are looking at mining properties in the White Hills, A. T.

CHAS. A. PEACH, of the Marguerite miue, near Auburn, has gone East ou a business trip.

ROSS E. BROWNE returned to this city this week after an extended trip on mining business.

LOUIS FALKENAU, the well-known assayer, has removed from the Safe Deposit building to his new office, 434 California street.

LOUIS JANIN JR. left this city this week for Australia, where he will remain a few months and then extend his trip to the South African gold fields.

J. M. B. PERRY, the metallurgist of Aspen, Col., has brought five miuers from Leadville and is to work the mines at Chloride, A. T., purchased from Stephen Smith.

C. S. BATTERMAN, mining engineer, and C. S. McHenry, both of Aspen, Colo., are in Alaska making an inspection of the various available mining properties in the vicinity of Juneau.

ON Monday evening a dinner was given at the University Club in this city to Director Wolcott of the U. S. Geological Survey. Among the guests were President Kellogg and Professors Le Conte, Hilgard, Bacon, Christy and Lawson of the University of California, State Mineralogist J. J. Crawford, Louis Janin Sr., Louis Janin Jr., Jno. L. Howard of the Oregon Improvement Co., Chas. G. Yale and Sidney V. Smith. Mr. Wolcott lectured at the Stanford University on Tuesday evening and left on Wednesday for Portland on his way back to Washington.

MR. WHITFIELD PRICE PRESSINGER, whose brochure on the "Widening Use of Compressed Air," issued a few months since, was so extensively noticed by the engineering and scientific press, has just returned from a visit to Europe. Mr. Pressinger is connected with the Clayton Air Compressor Works, New York, and although he went abroad solely for recreation, he did not fail to avail himself of every opportunity offered of studying the air compressor practice of the larger cities of the old world, and while in Paris had an extended interview with Mr. Victor Popp, president of the Paris Compressed Air Power System.

A Fine Combination Mill.

(*Continued from page 241.*)

feet. On reaching this floor the ore is thrown into the largest size Comet crushers, through which it passes and drops into the large ore bin ready to be run down into the self-feeders and on into the batteries.

The eight batteries are of the most massive and best design made, while the forty stamps weigh 850 pounds each. These batteries have single discharge from which the wet pulp runs over silver plates, where most of the gold is caught and saved by quicksilver. From the plates the pulp runs to the twenty-four six-foot Frue vanners, which save the concentrates ready for market or for further reduction in the mill. The tailings here go to the numerous sand-tanks, where the water is drained off. After this comes the work of twenty-four amalgamating pans and twelve settlers, which perfect the treatment of ore, after which it goes to the tailings dump. A mill of this class and capacity, built in the most substantial manner, is no small affair, especially when of the best of materials and the latest and most substantial machinery. The mill site occupies nearly six acres, and besides the mill there are other buildings and features of interest. The blacksmith shop stands by itself away from the mill, as does also the milling-room, assay office, two retorts, etc., in a building 30x40 feet, part of which is two stories, the upper one being used for storage of assay supplies, etc. At a convenient point a fine eight-room residence for the superintendent has been erected.

To operate such a mill requires a large amount of water. Tintic district in the past has suffered much because of the scarcity of water for all purposes. The Eureka Hill Mining Company was fortunate in securing an ample supply at Homansville. To get this to the mill required the putting in of powerful pumping machinery to send water through nearly 20,000 feet of six-inch pipe, with a rise of about 500 feet. To pump water that distance and maintain an ample supply at the mill at all times, made it expedient that there should be large tankage at the mill. A reservoir to hold 600,000 gallons is being constructed. A deep excavation has been made for this purpose. On the upper side the conglomerate is firm enough for this purpose and will be simply covered with cement while heavy walls are being put in on the lower side. Such are the more important details of this newest and best combination mill in Utah, and which will be in full operation in a few weeks. It was built by Fraser & Chalmers of Chicago.

The Coal Deposits in Washington.

The magnitude of the coal deposits in the State of Washington is little realized away from the Pacific coast. Not all the Atlantic States combined contain such a supply. Workable veins are known to exist in eighteen out of thirty-four counties, and they cover an area of more than 1,000,000 acres. The coal ranges in character from cannel to semi-anthracite, through all grades of domestic, gas, steaming, cooking and smithing coals. With the exception of the Roslyn mines in Kittitas county, the productive measures lie west of the Cascade range. They are all lignite and bituminous. Anthracite has been found in the Olympics and in the Cascades, and there is a fine deposit at the base of Mount Rainier. These, however, have not been developed sufficiently to judge of their values. The lignite measures extend from British Columbia on the north to the Columbia river, and east from Puget Sound fifteen miles. The area covered is estimated at 800,000 acres. Less than two per cent of it is owned by companies prepared to open up veins as soon as the market is ready for the output.

Grant's Pass Gold.

A Grants Pass man well versed in our resources estimates our annual output of gold at $500,000. As most of our mines are owned here this money stays amongst us and helps everybody in the community. It is lucky in these times of depression to be able to export something which does not depreciate and which adds to the world's wealth without making any individual in it poorer. This half a million of dollars is a conservative estimate. Our gold, unlike other products, goes out silently and secretly. No string of freight cars is necessary to haul it away; no great hurrah is ever made by the miner as he brings in his dust to sell in the city or express direct to the mint. For obvious reasons those interested in gold dust withhold information as to the amount of exportation or means of sending it away, but the many channels of outgo have been carefully figured and the result is at least a cold half million a year.—Rogue River Courier.

Eisleben, the birthplace of Martin Luther, is sinking into the moor upon which it is built. Measures have been taken in recent years to drain the bog without avail, and the inhabitants are seriously thinking of abandoning the town.

The Genesis of Gold Placers.

NUMBER II.—CONCLUDED.

Written for the MINING AND SCIENTIFIC PRESS by R. L. Dunn, M. E.

Very fine gold that can float in a moderate velocity of current of water is rarely concentrated to an extent compared with coarse gold, but considerable amounts of it accumulate with the stream drift during accumulation periods. Hardly appreciable even to the cubic yard, yet this fine gold amounts to an enormous aggregate when the tremendous masses of the drift accumulations are considered. In the cutting periods this fine gold is moved on with the mass of drift, very little of it getting down to the bedrock and remaining there with the coarse gold.

Primarily the formation of the placers is due to sub-aerial denudation and erosion. In the end this formation is more or less modified by the action of forces acting from the earth's interior. These last find their expression in regional elevation and regional subsidence and in the direct covering up of the sub-aerially formed placers by lavas and other volcanic flows. Except as to the last noted, the influence of these interior forces is apt to be unsuspected, even where it is very considerable. Many placers that would, under sub-aerial conditions alone, be temporary unconsolidated formations, become relatively permanent as a result of the action of the earth's interior forces. In its simplest form the placer is an unconsolidated formation of the existing geological period, and such placers have been formed in every geological period of the earth's history during which there was a sub-aerial erosion of auriferous lodes. Such remains of these geologically ancient placers as have been discovered and identified, owe their preservation and more or less altered condition to the action of the earth's interior forces, and it has become necessary to broaden the significance of the term "placer" to include them. The auriferous region of California contains within it examples of placers of several geological periods in several conditions of modification of situs and character by reason of the action of the interior forces.

The placers of the "Recent" existing geological period consist of the deposits made in the direct formation of the existing stream basins by sub-aerial erosion. These are the present stream beds and sections of older beds of the same streams commonly known among the miners as bar and bench placers. Their gold content has been derived not only from the direct disintegration of auriferous lodes in place, but from the secondary erosion of the placer deposits of preceding geological periods. Generally speaking they are shallow deposits and very rarely even cemented. As a rule they are readily distinguishable from older placer formations by their relative position alone. There are, however, some unconsolidated shallow placer deposits of limited extent in Siskiyou and Trinity counties high up on the summits of the mountain ranges, which seemingly ought to be of "Recent" origin, yet on that hypothesis the manner of their formation is hardly comprehensible. The fact is, that despite superficial appearance, they are not of "Recent" origin, but are very likely the fragmentary remains of stream channels of Tertiary, or even greater, age. Their apparently inexplicable position is due to a considerable regional uplifting, which has at the same time protected them from complete obliteration by the general denudation and erosion of the Post-Tertiary age.

The old channel placers proper of the Sierras are of Tertiary age, Miocene and Pliocene. While sometimes found unconsolidated, they are more frequently lightly cemented and occasionally so compacted as to be a conglomerate. They have been protected from denudation and erosion both directly by being covered by enormous masses of later tertiary and quartenary lava and other volcanic flows, and indirectly by the subsequent regional uplift of the same geological period. This latter has had the effect of minimizing the denudation and erosion on the higher portions of the surface, very generally the lava filled old stream channels, and of concentrating and intensifying denudation and erosion in the lower portions of the surface, the channels of the existing streams. To these conditions is very largely due the table land and canyon topography so characteristic of the Sierras. To this regional uplift is also due the preservation in part, at least, of the bars and benches of the existing streams. Also it is the explanation of the otherwise inexplicable gradients of many of the tertiary channels as determined in the course of mining operations. The axis of the uplift being north of the channel region, the effect has been that wherever the flow of the old channel was northward the original downward grade has been flattened and even reversed in some instances, and wherever the flow was southward the grade has been increased. This phenomena has been very clearly elucidated by Waldmar Lingren, Field Assistant, United States Geological Survey, in a paper entitled, "Two Neocene Rivers of California," (Bulletin Geological Society of America, Vol. IV). The Tertiary placers are generally considered to be the stream accumulations of Miocene and Pliocene rivers, and there are evidences of some of them being older than the miocene (Cretaceous), and others more recent than the Pliocene, (Quartenary). The fact that the geological evidence is conclusive as to the Sierra region not having been below the sea since the Jurassic period would sustain the presumption of Cretaceous or Eocene origin to some of the placer deposits. The period of lava flows and channel obliteration by volcanic action, not of one system of channels, but of several systems of channels formed successively in the intervals of quiescence of the volcanic activity, extending into the Quartenary period would bring the probable formation of some of the placers as late as that period. It is notable that all these Tertiary, lava-filled channels are not auriferous, but the evidence that the channels of any particular system of the several were not auriferous as a distinctive characteristic is not conclusive. What have been termed "Cement Channels," being channels in which the lava comes in direct contact with the bedrock, without a stratum of auriferous gravel between, are not necessarily the channels of one particular system, but may be, and doubtless are, portions of the channels of all the systems. The absence of gold would indicate that that particular channel made no primary erosion of auriferous lodes above the point being examined, but would not necessarily be conclusive that it was not at some point above auriferous by reason of its erosion of the unconsolidated drift of some older channel. The fact that the gold in the older deposit was free would preclude its being moved very far in the second erosion.

The two described classes of placer deposits, those of the existing streams and those of the Tertiary streams, were long since identified, and the literature regarding them is extensive and accurate. It has been quite generally assumed that they include all of the placer deposits of California. Only during the last two years has this been disproved. There are, in fact, two additional distinctive classes of placer deposits considered both with reference to occurrence and geological origin. The writer, for the California State Mining Bureau, in 1893 made an extended examination of and a report on a peculiar conglomerated auriferous gravel deposit in Siskiyou county. (Unpublished, but will appear in the January, 1895, report.) This deposit proved to be the gravel-filled bed of a Cretaceous or possibly even Jurassic river. This conglomerated gravel bed lies unconformably in a depression of the older metamorphic rocks and is conformably covered with sandstones, identifiable as belonging to the Chico group of Cretaceous sediments. These sandstones in turn are capped with basaltic lavas, part of the flows of the later volcanic activity of Quartenary times. The conglomerate is exposed by the recent erosion which has swept away the lava and upturned edges of the tilted sandstones, and which has cut out and broken up some of the conglomerate—sufficient of the latter, indeed, to furnish an enormous amount of gold to a small area of shallow placers in the vicinity of Henley and to the Klamath river for twenty miles below where the old channel deposit was cut. Though this old channel has been deformed by tilting, the distribution of the gold is identical with the distribution found in existing and Tertiary channels. It is coarse, heavy channel gold, waterworn and free from quartz. The explanation of the unusual phenomena of occurrence of this deposit is not difficult, once the geological changes that have taken place in the locality are comprehended. The United States Geological Survey has covered the Cretaceous formations of northern California pretty thoroughly. From the publications of Mr. Diller, who had charge of most of the work in that section, it appears that the stratigraphic evidence is to the effect that during the Cretaceous period nothern California was subsiding, and with it an undetermined area of southern and central Oregon, and that the sea was gradually advancing northward from what is now the Sacramento valley. This is shown by the successive overlapping of the later Cretaceous formations northward. The ancient Cretaceous river occupied an erosion basin sloping southward. At first it contributed to the enormous thicknesses of the early Cretaceous formations known as the Shasta and Horsetown series. Ultimately it disappeared itself and became covered by the inflowing debris from the north and west which now forms the covering Chico beds. It escaped dispersion and obliteration as it was sinking simply by reason of the rate of subsidence being more rapid than the rate of beach erosion. It is now far above the sea level as a result of a reversal of the regional movement from subsidence to elevation. The phenomena of a river bed disappearing beneath the sea without any dispersal or disturbance of its bottom gravels is not unique to this Cretaceous example. The Klamath river of northern California is at the present time furnishing an example of this. What is known as Gold Beach, on the coast of California a few miles south of the outlet of the Klamath river, is nothing but an old drift-filled bed of the Klamath. This old channel can be traced thirty miles back into the mountains to a junction with the present channel. It is filled with an unknown depth of drift, sands, gravels and clays, and the old channel bed at Gold Bluff is so far beneath the sea level that the channel rims exposed are several miles apart. The sea erosion, which is limited to the surface at the shore line, is slowly wearing away the upper portions of

the drift, but is not disturbing the lower portion. If it should be consolidated and reappear as the result of another reversal of the earth movement, the auriferous deposit would be similar to that of the Siskiyou auriferous conglomerate.

In the Chico sandstones are conformably bedded some seams or strata of conglomerate. Nothing conclusive is yet determined as to the auriferous character of these seams in Siskiyou county, but farther to the northward in southern Oregon, in the vicinity of Ashland, beds of this stratified Chico conglomerate appear which are sufficiently auriferous to pay for working. So far the developments made are limited, owing to difficulties of extraction of the gold by the usual methods, but there is no reason why, with better methods, they should not be largely utilized as a source of gold.

Another exceptional placer deposit exists near Redding, in Shasta county. It is a small channel deposit, containing fine gold. It is not sufficiently developed to estimate either its extent or economic value. Its peculiarity is that though of unquestionable Cretaceous age and buried beneath hard sandstone beds it is an unconsolidated formation.

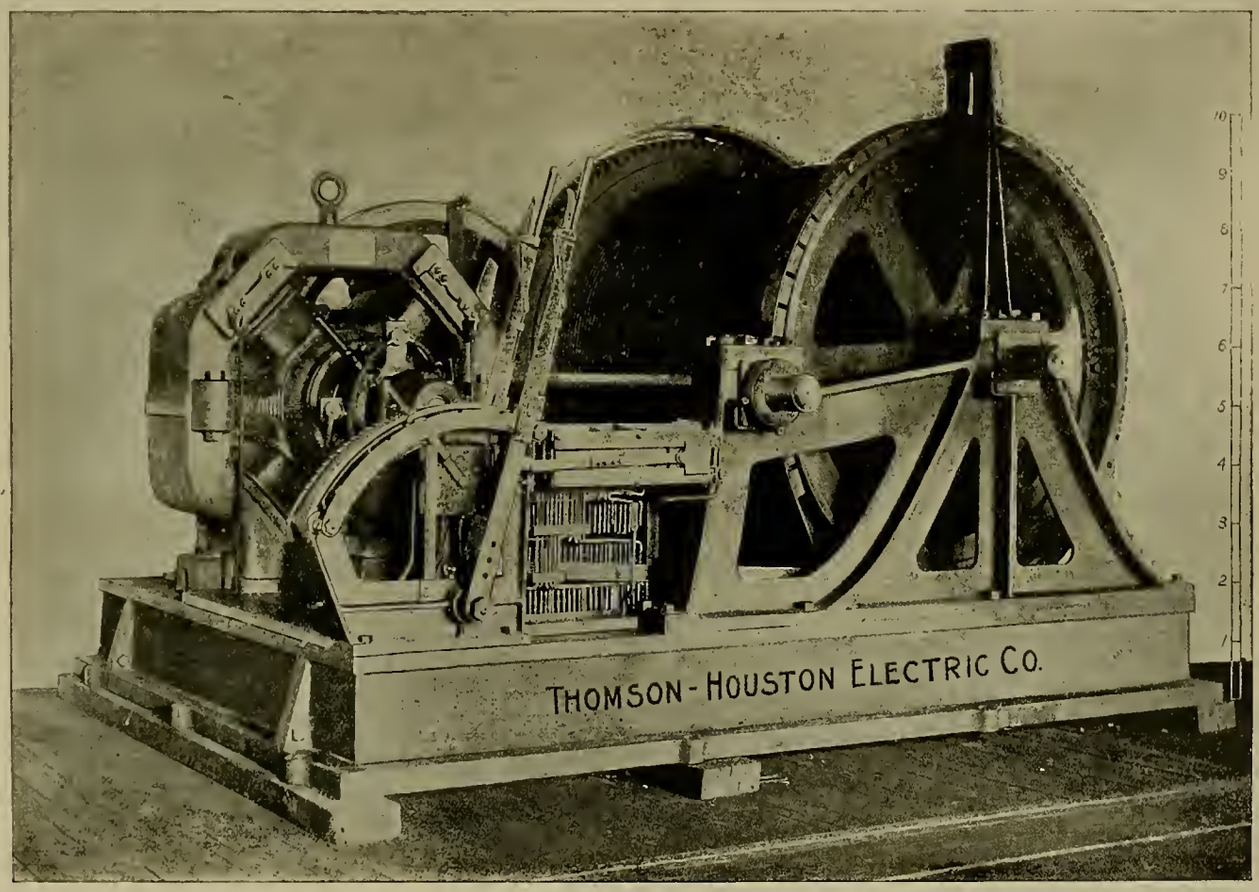
Since the identification of the Cretaceous auriferous conglomerate in Siskiyou county, the writer's attention has been called to two discoveries of auriferous conglomerates in the Mariposa slates formation of Jurassic age. It is in the Mariposa slates that the mother lode and other auriferous quartz lodes are found, and the occurrence of these auriferous conglomerates is conclusive in establishing the fact that there must have been a still earlier period of auriferous vein formation, the erosion of which furnished the auriferous deposits consolidated into these conglomerates. Both of these auriferous Mariposa conglomerates attracted the attention of miners to some extent. Shafts were sunk in them and a limited amount of mining done. Neither seems to contain sufficient gold to be of economic value. One of the identifications was of a conglomerate in Amador county, close to the mother lode. The other, with which I am personally familiar, is of a very extensive deposit fourteen miles northeast of Auburn, in Placer county. It is described by Mr. Lingren, of the U. S. Geological Survey, in the September number of the *American Journal of Science*. Both of these conglomerates, though of marine formation, were probably derived from the sub-aerial erosion of lode deposits. Their identification furnishes an explanation of the origin of auriferous slates independent of theories of gold deposition by chemical force. The gold in such slates being extremely fine, there is no improbability inherent in its being deposited with the fine sediments which ultimately become slates.

As a conclusion from the preceding, it may be safely affirmed, that there has not been a distinctive auriferous gravel forming period in the geological development of the California gold placers. On the contrary, there have been whenever there were auriferous lode deposits exposed to sub-aerial erosion—and that condition has been practically continuous from Pre-Mesozoic times—placer deposits formed. The backward range in time of the remains of these placers is specially instructive in reference to the times of lode formation. What has been in this article stated in this connection is intended to be rather suggestive than as expressing positive conclusions. A more detailed investigation of these varied placer deposits, not alone in California, but as well in other gold-bearing regions, will very likely lead to substantial economic results. Once the possibilities of distribution of gold in sedimentary formations becomes understood, an intelligent search can be made for it through a much greater range of rocks. This is specially so in relation to the conglomerates in auriferous localities. There is no geological reason why the auriferous conglomerates so extremely extensive and rich in the Transvaal in South Africa should be limited to that locality. The auriferous conglomerates of northern California and southern Oregon in superficial appearance are almost identical with the South African. A thorough exploration may prove them to be as rich and as extensive in range. I have not had the advantage of a personal examination, but am told there are similar conglomerates in British Columbia, but whether or not auriferous my informant could not say. There is, however, a strong probability that they are auriferous, sufficient to justify exploration and prospecting.

A clear understanding of the phenomena of placer gold occurence and distribution, as presented in the first portion of this paper, will likely prove of considerable assistance in determining the probable gold content of placers. Though it is not at all probable that any set of rules would prove conclusive in application to determining the gold content of every placer deposit, yet it is possible to so apply an exact knowledge of the formation of particular deposits as to have an added certainty to the correctness of conclusions relating to its mining.

Electrical Mining Hoists.

This style of hoist, of which an illustration is given on this page, is of strong and simple construction. The motor is of the regular stationary or M. P. type, mounted on the same bed plate as the hoist, and to which all bearings, levers, quadrants and other connections are attached, making the machine complete within itself and insuring great strength. The drum is provided with a powerful band or post brake, lined with wood and operated with a lever and quadrant. The motor is furnished with a reversing switch, so that in lowering, the load can be kept under control of the operator should it not be thought advisable to rely entirely on the brake. The speed of the hoist is regulated by a rheostat and controller of the latest pattern, actuated by a lever and quadrant conveniently placed. The steel pinion on the armature shaft, and the intermediate gear wheel which engages it, have machine-cut teeth, and all the gears are furnished with guards. The large pinion engaging the drum gear is bushed with hard brass and fitted with a clutch, so that the intermediate gears and motor armature need not run when quick handling and rapid lowering are desired.



ELECTRICAL MINING HOIST.

Improvements in the Cyanide Process.

The success which has of late been obtained in the recovery of gold from the tailings of stamp batteries represents a matter of the utmost importance to the immediate future of gold mining says the London *Mining Journal*. Nothing less than a revolution in the prospects of gold bearing deposits resulted from the practical application of the principle that cyanide of potassium can be used to dissolve gold, and that the precipitation can be effected by means of zinc shavings. For the past few years the burning question in gold mining has been how to work out this cyanide process so as to get the best possible results. It is only quite lately that details have become so far perfected through the experience gained in its actual working as to give results anything approaching those which were expected. In the first place, it has been found impossible to work the cyanide process successfully with inefficient crushing appliances. Upon the perfect pulverization of the ore depends very largely the degree of efficiency obtained in the working of the cyanide vats. To this fact are to be attributed in some measure the failures which have followed the adoption of cyanide in many gold mines in the United States and in Australia, and it is one strong influence in the marked movement now proceeding for enormously increasing the weight of stamping heads—up to 1050 lbs. each in the latest instances. Then the appliances, and even the methods of the cyanide works, require a careful attention to details and a special knowledge only acquired by long experience of the process. There is at the present time hardly a cyanide plant in the Witwatersrandt—the home of the cyanide process—which does not include much that is purely experimental. At the same time, there is a striking advance in the latest plants to those which have been only recently erected. The recovery of gold by the use of cyanide of potassium is, however, now extending largely in many other gold fields than that of the Randt; and amidst the rivalry of engineers and managers in different countries there should certainly develop many important and valuable improvements

in practice. Trials upon a more scientific basis are to take place again in America and Australia, and we are glad to hear that capital is being provided—though, unfortunately, from the United States—to treat the gold bearing ores of British Columbia with cyanide of potassium.

One of the principal economic difficulties of the cyanide process has been the transport of the tailings. So far as we can judge it will be fouud cheapest to utilize mechanical wire rope haulage. Then the expeditious discharge of the tailings is a most important matter, as upou the rapidity with which the plant can be worked must depend largely the amount of capital required in the first instance. Large improvements have been made in this direction lately, especially at the Langlaagte Royal, where the time of discharge has been reduced from five hours to three, or three-and-half, by means of patent doors. What is now wanted is a light dredging apparatus for facilitating the emptying of the fixed tanks, and there can be no doubt that the ingenuity of mining engineers will be fonnd equal to providing this. Tailings pumps, though they have been largely adopted do not seem to have met with any success over a protracted period of working. Undoubtedly, it would be a most valuable step in the progress of the cyanide method of ore treatment if efficient pumping appliances could be obtained to get rid of the tailings, instead of depending upon gravitation for their discharge. Apart from this important question, a good deal in the efficiency of the process depends upon the means used for distributing the tailings in the vats. There are many systems at work for doing this, rangiug from revolving arms of different lengths to ribbed disks with a spraying motion. Continual improvements are being made by practical men in these details which, of course, deal rather with the reduction of working expenses than with any especial increase in the efficiency of the process. But cheapness must be after all the primary quality of any process which is intended to deal with the residuum of low grade ores, and thus make their working a matter of profit. Shareholders in Transvaal gold mines will know how bitterly they have been disappointed in many cases with the results of newly erected cyanide plants, which were expected to make dividends practicable. They should, therefore, be gratified to receive our assurance that inventiou is active in this detail work upon which the ecouomic success of the process depeuds.

At present the efficieucy of the process is very much compromised by the fact that the amount of cyanide used is greatly in excess of the theoretical quantity necessary for the treatmeut of the ore, and as no means have yet been found for utiliizng the cyanide over again, this represents a considerable item of loss to the shareholders. Apart from this, it is seriously a question whether some steps will not have to be taken before long to prevent the escape of the liquid which has converted the vast heaps of residuum outside the mine into mountains of prussic acid. So far, no inconvenience seems to have been felt at this presence of poisonous deposits in the midst of a growing populatiou, but the danger is one that will have to be considered in the future development of the Witwatersrandt mines. It is almost certain, however, that the difficulty will be overcome very shortly either by an improvement of the cyanide process or by the invention of some new method of treatment. While the owners of the cyanide patent are able to reap such enormous profits from their discovery, it is not surprising that other inventors should seek a fortune in the same way. By the aid of electricity it has been songht to prevent the waste of cyanide by using it over and over again, and an attempt was made some time ago to replace the process by another in which the basis would be aluminum. So far but little has beeu done in this direction, though the advances made lately in experimental work would lead to the belief that the time is not far distant when the ore will be treated in a more economical manner thau is now possible. At present, the cost of treating tailings ou the Randt may be taken as an average for new and properly coustructed plants at 5s. a ton, and if the experimeuts uow being made should prove successful upon a large scale, this sum will shortly be reduced to 3s. 6d. per ton, thus leaving a balance of 1s. 6d. per ton as a clear profit to the shareholders. This refers only to working details, but there is besides the very important question of concentration of tailings to be considered. Experiments recently conducted at the Ferreira mine confirm the opinion which we expressed some time ago, in opposition to the rather discouraging attitude assumed by the Witwatersrandt Chamber of Miues, that it was perfectly possible to take out the rich ore in the coucentrates aud treat them separately. All these things should be most satisfactory to mining engineers, managers, and shareholders in all parts of the world; but, after all, they are by no means the most hopeful of the teudencies which are at present developing towards the more economical treatmeut of battery tailings and slimes. We have dwelt ou them, for the purpose of forshadowing benefits that many be shortly realized, but the advantages promised by the discovery of the actually new cyanide processes are more far-reaching. There are two or three such processes of which the theoretical success, at least, is said to be fully proved.

The Los Angeles Oil Developments.

The Los Angeles *Commercial Bulletin* has this to say of the new petroleum developments in that city:

About half a mile west from the center of the city, on the hills between First and Temple streets, there may be witnessed a sceue of rare activity. The profusion of derricks, boilers, steam engines and oil tanks cannot fail to convince the most skeptical that an exceptional development is in progress there. Evidences are within sight of the existence of not far short of 100 wells, and the field of operations is being rapidly extended. Conflicting views are entertained concerning the relative importance of the oil discoveries. Some conservative experts, more or less interested in neighboring oil fields, express the opinion that what has been tapped is a mere seepage, and not an oil deposit proper. They state that the net surplus yield of oil from this new source over and above the amount consumed in boring and pumping probably does not exceed 175 or 200 barrels daily, and that of a low grade; and that this product can be disposed of in the city for ordinary purposes without even affecting the previously established market price; and that its chief value consists in the contained asphalt. Others more sangnine, though not apparently concerned personally, say that, on the contrary, the daily output already exceeds 500 barrels; that the value of crude oil has in consequeuce declined to $1.40 per barrel from its previous level of $1.75; and that the new supply includes various constituents of special value, such as benzole, naphthalene and basic acid. They allege that coal is no longer fetched here except for domestic aud railroad use, and that new employments must be sought for the increasing oil product. The local yield, secured at a considerable elevation, it is apparent can be easily piped to convenient stations, even at considerable distances, and it seems not improbable that the railroads may be the next to turn it to account in the interest of economy. Southern California has now three main sources of supply of mineral oil—the Ventura county wells, situated uorthwest of and partly within Los Angeles county, the Puente wells eighteen miles southeast of this city, and the most recent source in the city of Los Angeles itself. Sau Francisco draws its supply by means of a tank steamer from Peru in South America. The daily consumption of Los Angeles City is said to approximate 700 barrels, and there are outside manufactories and establishments that consume large quantities, such as the Chino sugar factory, that takes five carloads, or about 660 barrels, daily. There appears, however, a good prospect that the latest oil discoveries, those in the city of Los Angeles, may lead to a considerable increase of manufacturing industry in this neighborhood, for it must be remembered that the present development has been accomplished for the most part within three or four months. Indulging, therefore, in no more than a reasonable amount of anticipation, we may say that after an extension of the business already carried on here, such as iron rolling, the manufacture of structural iron, of iron pipes, steam and gas engines, etc., it would seem to be an easy transition to the smelting of the various ores that abound throughout our tributary country; and it is expected that the increase in our fuel supply will hasten the extensiou northward of the Nevada Southern railroad, which will place at our disposal the finest iron deposits in the world, only 300 miles distant. From smelting naturally results the manufacture of various staple chemicals, such as arsenic, sulphuric acid, boracic acid and caustic soda, and from the oil itself can be extracted vaseline, neutral and lubricating oils, axle grease, inks, lamp black, electric carbous and aniline dyes, all of which can be shipped everywhere. Competent authorities allege that the supply of the various minerals from which the most essential and useful chemicals are manufactured is unbounded. It is to be expected that the command of such a variety of valuable resources will attract properly qualified specialists to their development here, and that in the language of one of the best informed local authorities, Mr. Sutherland Hutton, this city may become after a time, "the Pittsburg of the West." It is also well kuown that there are ample and conveniently situated deposits of potters' clay and kaolin, as well as of sand adapted for the manfacture of glass, the utilizatiou of which has hitherto only been prevented by the absence of a sufficient local consumption for the manufactured products, but which may now soon be set in motion, while it is hoped that the general increase of activity accompanying the oil discoveries may assist in advancing our claims for the construction of a local harbor capable of accommodating the largest sea-going craft. In this last respect they are particularly timely, seeing that a visit from the Senatorial Committee selected to advise upon this business is daily expected.

Such is the barest sketch of the attractive possibilities that the development of a local oil field appears to open up to this city aud surroundings. Its further progress will be followed with the liveliest interest; and while local residents will have general sympathy in their efforts to abate the smoke nuisance, it should be understood that any interference with the pursuit of such a promising industry in the public interest cannot be entertained for a moment. It may be well to remind our readers that whereas ten years ago the use of oil as fuel, beyond the production of the power employed in the operation of the Eastern wells, was unknown, and the suggestion of its general employment in that capacity was received with alarm and reprobation, to-day its daily use as fuel in the United States is 30,000 barrels; and that no little part of the hard work expended in bringing about the required transformatiou of public feeling on the subject, and in procuring the appropriate adaptation of furnaces, was put in right here in Los Angeles, and was instigated by the pressing necessity for some cheaper fuel than coal, either imported or hauled long distances from the interior, for any considerable developmeut of local industry.

The present total daily yield of petroleum in southern California is approximately figured at 1750 barrels, composed as follows:

	Barrels.
Union Oil Co.	500
Pacific Coast Oil Co.	250
Lacy Manufacturing Co.	200
Los Angeles City	500
Miscellaneous sources	300
Total	1750

Three aud three-quarter barrels are equal to one ton of the best coal, and the whole of this product, it is said, could be consumed on the one line of railroad between National City and Barstow; but the yield, we are told, conld be doubled within six months, aud besides the Union Oil Co. holds a stock of 92,000 barrels. The coal market has gone all to pieces. Large buyers, we learn, can now supply themselves at $5.50 per ton, a condition which is due to the geuerally depressed state of trade throughout the world.

Special advantages of the recently broached city supply are its moderate distauce from the surface—the average depths of the wells, we understand, being but 650 feet, though in some cases exceeding 1100 feet—and the soft and permeable character of the intervening strata. These peculiarities, along with the comparatively high valne of the location, no doubt account for the great number of the wells snuk within the present limited field, as well as for the scarcity of gas in the deposit, its lack of expansive force or gush, and the consequent necessity for bringing nearly the whole of it to the surface by pumping.

The Canadian Asbestos Industry.

J. T. Donald writes to the *Engineering and Mining Journal* as follows:

The following particulars of the present condition of the Canadian asbestos industry have been obtained by the writer in a recent visit to the mining district. There is at present no prospecting for asbestos, and with one exceptiou, to be noted hereafter, no business in buying and selling mining properties. After a somewhat prolonged period of dullness in the crude asbestos market, there are now decided indications of a legitimate improvemeut. Evidently stocks in the hands of manufacturers are running very low, and there is a moderate demaud from all parts of the world.

With the asbestos miner it is not now so much a question of finding buyers as of finding a margin on the prices offered. Sales have recently been made at the following prices f. o. b. at the mines: No. 3, a round lot at $40 per ton; No. 2, $65 to $67.50 per ton; No. 1, $115 to $140 per ton.

Nos. 2 and 3 are the grades mostly called for, and these are more largely produced by the mines. No. 1 quality is apparently not as much sought after as in the past, and as a consequence there is a notable stock of this grade in producers' hands. This is doubtless due to the very high price asked for the first quality during the speculative period of three years ago, which caused manufacturers to devise improvements in plant and methods, which enabled them to replace the costly fiber by lower grades. At the same time there is a limited demand for fiber of the very fiuest quality as to length and color and freedom from impurities; for example, a leading dealer recently was offering $150 per ton for thirty tons that would answer to certain specifications by no means beyond the choice product of our mines.

As a consequence of the improved inquiry for crude asbestos, the large and well-equipped mines, with two or three exceptions, are being worked, not to their full capacity, but yet to an extent that will make the output of 1894 a decided advauce on that of 1893. Fully 3300 tons have been exported during the first six months of this year.

The old Jeffrey mine near Danville, on the Quebec brauch of the Grand Trunk railway, has long been of geological interest from the fact that it occupies a knoll of asbestos-bearing serpeutiue, distant from forty to fifty miles from any other known deposit of asbestos. This mine, which has also possessed a local interest, inasmuch as it has been owned and actively operated by the oldest miner in the province, a veteran of some four score and seven years, has recently changed hands. It is now being vigorously worked by two of our most enterprising Canadians, who are at present employing 150 hands. These new owners have the great advantage of being in close touch with manufacturers of asbestos goods, and it

is probable that this well-known mine will become even more prominent than it has been in the past.

The old problem of separating the lower grades of fiber from the enclosing rock is still to the fore. A special feature in this connection has been the installation by Messrs. W. G. Costigan & Co., of Montreal, of their cyclone fiberizing machine in three of the most important mines; viz., the Jeffrey mine mentioned above, the Anglo-Canadian mine at Black Lake, and the Bell mine at Thetford. In this cyclone machinery the low-grade asbestos, which is rock and fiber in intimate association, is introduced in small lumps, which, meeting two rapidly revolving discs running in opposite directions, have their non-fibrous particles reduced to powder by attrition, while the liber, by reason of its nature, escapes injury, which is by no means the case when rolls or crushers are used. After leaving the cyclone the grit or gravel is separated by means of a series of screens, which, to a certain extent, also separate the fiber of different lengths.

Electrical Surface Haulage.

The cut on this page illustrates the largest and most powerful electric locomotive built up to date. It is shown hauling a train of loaded freight cars, weighing over 200 tons, up a three per cent grade and on a curve of 150 feet radius. This locomotive

ELECTRIC LOCOMOTIVE, BUILT BY THE THOMPSON-HOUSTON CO.

has been constructed by the Thompson-Houston works of Boston, for the Whitin Machine Company of Whitinsville, Mass., where it is used for hauling freight cars from the factory to the main line of the railroad. One motor, having a maximum capacity of 125-horse power, supplies the motive power. This motor is geared to the forward axle by a train of powerful cast steel gears. Parallel rods connect the two axles. The distance between the centers of axles is six feet four inches, and the diameter of the drive wheels is forty-two inches.

The motor is made with a waterproof finish throughout, specially designed for the purpose. The armature makes 1000 revolutions per minute when the car is running at a speed of five miles per hour. This speed is reduced by the gears in the proportion of from twenty-five revolutions at the armature shaft to one at the axle. All the gears are of steel and entirely enclosed in oil-tight iron cases filled with heavy oil to insure quiet running and thorough lubrication. The largest gear, that attached to the axle, has an eight-inch face.

Hydraulic Dam.

The Omega Mining Company are having the lumber necessary for the construction of a dam on Scotchman's creek delivered. The dam will be a dirt and brush dam, and is the most extensive operation of the kind that has been undertaken in this county. The work of actual construction will begin next Monday.

The dam will be built under the supervision of a representative of the Debris Commission, and when finished will permit the operation of the Omega hydraulic mine, which is a very rich property.—Nevada City Herald.

The Miners' State Convention and the Silver Question.

TO THE EDITOR:—It may be said that California has no especial interest in the silver question and that, being mainly a gold-producing State, we are working against our own interest in advocating silver; but this would be rather a contracted view to take. Anything that brings more money into general business channels, benefits every branch of industry; and silver is money or rather would be if the laws were so amended as to replace it on the footing it once had. The civilized nations of the earth are all satisfied with silver as money, while the Eastern and Indian nations prefer it. The only enemies of silver are the bankers; they have become so wealthy that they see no room in their vaults for so bulky a money as silver. They have forgotten the needs of the poor and of the value of silver to the general community.

It is unnecessary to enter into figures to prove this position, as it is an every-day matter and not pertinent to what we started in to speak of, which is, that our California gold miners should not overlook the benefit the resumption of silver mining would be to them, and in the way of bringing into circulation more money.

The California Miners' State Convention which takes place next month should give the silver question more consideration than has been given to it at any convention previously held, and, to that end, delegates from every section should be instructed by their organizations on the subject. For or against it, as may be, silver is one of the vital questions of the day. Why all the vast silver fields of the various States and Territories should be lying idle while the whole world is clamoring for more money, can only be accounted for by the fact that the monied powers of the world hold in slavery the people, and to break through this usurpation of power the people must act, and in acting define the monetary laws for universal good and self-protection.

History shows that the slavery of the Dark Ages was brought about in part by the decline in production of the precious metals, and in proportion as any country destroys its gain, in such proportion is the downward trend of comforts and civilization.

We have only to review the prosperous past to comprehend what would be the future as compared with the present, if silver mining could be re-established, which laws of our own making could do. It behooves the gold miners of California to stand by the silver miners of the silver-mining States and Territories. ALMARIN B. PAUL.

San Francisco, Oct. 18, 1894.

Alaska Beach Sands.

The *Alaska News* of October 4th says: Tom Ashby and Geo. M. Mason arrived here from their ruby sand beach diggings, near Cape Fairweather, on the schooner Nellie Martin, last Saturday. The men employed by them, namely, J. Pennypacker, Jas. White and Cornelius Edwards, also returned. Tom Ashby states that they had built three houses—one 18x18 feet, and the other two 12x14 feet. They cut and surveyed the flume line of 2500 feet, so that next spring they would be able to start building the flume and three lines of sluice boxes, to wash the gold-bearing sand. In trying to float two rafts of 8000 feet of lumber across the creek to their diggings, the rapid water floated half their lumber into the surf, which was broken up and lost. This loss prevented them from building the flume this season. The beach averages 400 feet wide, the pay sand extending into the woods and runs up and down the beach for two miles. In some places prospect holes showed the ruby sand in layers five feet deep. They will return next spring and work the entire season. Their flume will be eight inches deep and twelve inches across, and will tap a large stream of water about 2500 feet from the beach.

Tule Canyon Gold.

The *Silver State* says: Near Death valley, in Tule canyon, Nevada, some rich gold mines should be opened. In this canyon, rich dry diggings were discovered some fifteen years ago. In 1880 a few men were at work there. They had no machines for dry washing, and did not even winnow the dirt by tossing it up in the air, Mexican fashion. They simply dug over the ground with picks, collecting such pieces of gold as they happened to see. In this way they made good wages in ground from two to four feet deep. Working in this rude way they found one nugget that weighed five pounds, and very many worth from $5 to $75. Pieces of gold worth about fifty cents were the smallest saved working in this way—"by eye." With water or even dry washing machines, such ground should have paid immensely. As all the placers in the great basin region are of local origin, Tule canyon must cut one or more large and rich veins of gold-bearing quartz.

Reduction Works in Sacramento.

A few months previous to the strike a project was under way for the establishment in Sacramento of reduction works for the oxidation of rebellious ores and the utilization of the other constituents besides gold. The project has been revived again and promises to become a certainty, as half the necessary amount is pledged, says the Sacramento *Record-Union*. The plan is to put up machinery capable of handling ten tons per day, and buy outright the concentrates from Nevada and other mines, instead of reducing them on a commission. It is calculated the concentrates or sulphuret ores can be roasted at a cost of $3 per ton and the gold extracted. Those from certain mines are rich in iron sulphurets, which will leave a residue which, when ground to powder, makes a high-class fireproof paint, and when treated by washing also produces large quantities of sulphuric acid. Ten tons of these ores, it is calculated, will turn out, in addition to what gold they may contain, seven tons of mineral paint and ten tons of sulphuric acid. The promoters figure, therefore, on an absolute certainty of large returns for their outlay, and a speedy enlargement of their plant. If their expectations are realized the industry will prove a great addition to the city's prosperity.

Scientific Progress.

The Greatest of Modern Problems.

Mr. Newton Harrison, E. E., in writing for the *Electrical Age*, states that the problem of mankind—the economical production of energy—has been attacked on all sides by some of our most eminent scientists. It is openly confessed that some other method than the mere combustion of a fuel is necessary in order to obtain a greater percentage of its stored energy.

Osmose—hitherto a superficially treated subject—is a rich field for the investigator. The pressure set up by a body when dissolving in a liquid, or a solution when mixing with water, may assume an enormous value. Common sea water acts with a pressure of 300 pounds per square inch in its tendency to mix with pure water. It is the substance in solution that causes this pressure and is true for all dissolved substances.

The resolution of the theory of the primary cell to such a basis places us on a more substantial footing than ever before. Dr. Ostwald shows the parallel relationship existiug between osmotic and electrical pressure. In other words, to obtain great E. M. F. from a cell, we must select two materials as elements with the greatest difference of osmotic pressures.

As Dr. Ostwald states, "The zinc and copper of the Daniell cell are two such sources of current of different potential and the difference of their electrical pressure is based on the difference of osmotic pressure with which the zinc ions and copper ions are respectively endowed." A factor that will affect these conditions is the electrolyte. An electrolyte must be chosen whose reactive effect when charged with zinc ious will be least, while for the other electrode it will be greatest. By this means we are best prepared to make the most efficient combination with the elements at our command.

In this introduction to the subject of cousumption, the inefficiency of a steam plant, the loss of ninety per cent of the energy of the fuel is due to the difference in temperature between the fire and boiler.

Upon presenting this fact to our recollection, Dr. Ostwald points out a method for obtaining the chemical energy of the coal without heat. He shows that the application of an acid to the zinc in a zinc and platinum cell is not productive of the greatest E. M. F. The greatest electrical effect is produced by the acid being applied to the passive electrode.

From this principle he contemplates the possibility of oxidizing coal, not by the oxygen in direct coutact with the coal, but by the interposition of an unconsumable electrolyte. By this unexpected means the entire chemical energy of coal may be utilized, and in a manner so subtile and refined that no visible sign will appear of such an intense action.

The searchers after gold—the plodders of an early age—have been succeeded by more apt investigators—animated by a loftier purpose; they seek uot to make gold, but to save it.

The Secondary Products of Combustion.

A statemeut has been communicated by M. Iloswa to the Bulletin de la Societe Chemique de Paris respecting certain determinatious made by him of the formation of secondary products coutaining nitrogen by combustion in air. The author considers he has proved that, on burning in air one and the same volume of coal gas and of hydrogeu, one and the same weight of nitrogen is converted into ammonia. On burning equal volumes of coal gas and of hydrogen, the nitrogen transformed into nitrous acid will also have approximately the same weight. But on burning carbon monoxide, nearly two and one-half times more nitrogen is found in the state of nitrous acid than in the former case. Supposing one kilogramme of each of these gases to be burnt, the most nitrogen in the state of ammonia, and in the state of nitrous and nitric acids, is found in the product of the combustion of hydrogen, only one-fourth of the quantity being found in the case of coal gas, and about one-twentieth in the case of burning carbon monoxide.

On burning wood charcoal in air, whether merely dried or heated to redness, the quantity of nitrogen contained in the nitrous and nitric acid collected is almost equal to that of the product. There is not much difference in the result of burning an equal weight of coke. The formation of ammonia during the combustion of coke or charcoal is merely a result of the decomposition of these substances. Otherwise it would be difficult to understand why the weight of the ammonia formed should vary according to the degree of heat. On burning coal gas and hydrogen, the sum of the equivalents of the acids named is from eleven to fifteen times greater than the figures of the equivalents of the ammonia. M. Iloswa remarks that hydrogen peroxide is one of the constant components of the atmosphere, and almost always accomplishes the reactions commonly attributed to ozone. He gives up as impossible the determination of atmospheric ozone upon a scieutific basis.

Weight and Horse Power of Rain.

One inch of rain falling upon an area of one square mile is equivalent to 2,323,200 cubic feet, or nearly 17,500,000 gallons, and this quantity of water will weigh 145,200,000 pounds, or 72,600 short tons. If one inch of raiu fell over the entire area of Philadelphia, 129 square miles, the quantity of water which would be precipitated would be represented by 2,250,000,000 gallons, or 18,730,000,000 pounds, or 9,365,000 short tons. Therefore the quantity of water represented by one inch of rainfall distributed over twenty-four hours falling upon the area of Philadelphia would be nearly ten times the maximum pumping capacity of all our waterworks engines for a day, aud is more than twice the total capacity of all the reservoirs now connected with the city water supply. Professor Loomis gives the average height of clouds at about two miles, and as the aqueous vapor always present in the atmosphere is suspended for a considerable time and carried for great distauces by winds, it is highly probable that the great majority of the water which falls as rain has been elevated by the sun to a height approximating 10,000 feet. While it would be fair to assume this figure in calculations, there may be objection to it on the ground that the clouds from which much of our rain is precipitated are not more than a half mile above the earth, and, therefore, a height of but 3000 feet will be estimated for, but those who desire to assume the greater elevation can readily calculate what the figures would be for 10,000 feet. As above shown, the weight of oue inch of rain upon one square mile is 145,200,000 pounds; multiplying this by 3000 feet for the height, and dividing by 60 on the assumption that this inch of rain fell in one hour, we have as a result 7,260,000,000 foot pounds representing the amount of work done by the sun per minute if the water was raised as rapidly as it fell. This is equivalent to 220,000-horse power. If pumping machinery worked at the low economy of two pounds of coal per horse power per hour, or if the pumps gave a duty of 100,000,000 foot pounds, 200 gross tons of coal would be required to raise to a height of 3000 feet the water represented by one inch of rain on a square mile; now multiplying this by 129 to represent the area of Philadelphia, we have 28,380,000-horse power and a coal consumption of 25,800 long tons.—Mr. John Birkinbine, before the Engineers' Club of Philadelphia.

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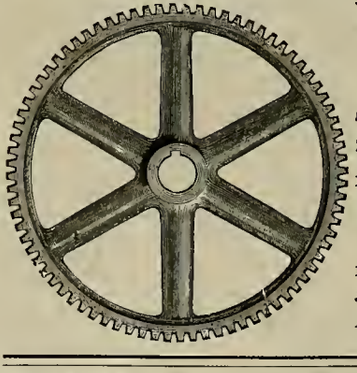

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Mechanical Progress.

The Making of Tool Steel in Sweden.

In a paper dealing with the manufacture of open-hearth steel in Sweden, read before the American Institute of Mining Engineers, Mr. Erick Odelstyerna gave the following information regarding the making of tool steel: For the manufacture of hard, first-class tool steel, pig iron as low as possible in phosphorus is, of course, required, and is made from the most non-phosphoric ores obtainable, with the use in the blast furnace of charcoal nearly free from phosphorus. Tests made by Prof. R. Akerman have shown that the charcoals delivered from the sawmills in Norrland, and made of wood from which the bark had been taken off before it was floated down the rivers, are those most free from phosphorus. If such charcoals cannot be had cheaply enough, local pine charcoals are used, the more phosphoric charcoals made from other kinds of wood being avoided.

In hard steel it is preferred to keep the phosphorus under 0.03 per cent, and no steel is called first-class which has 0.035 per cent or more. The best sorts contain 0.022 per cent and less. The sulphur in the pig iron has not quite as much influence on the steel as it has on the soft steel, because the effect of manganese on the toughness is not as noticeable with the higher percentage of carbon, and therefore more manganese can be added; but the pig iron and steel are not allowed to contain more than 0.02 per cent of sulphur, if, indeed, even this does not require too great a percentage of manganese. This is not a very difficult condition, for with the careful roasting of the ores always performed at the blast furnaces, and with sulphur-free fluxes, it very seldom happens that the percentage of sulphur in the pig iron is higher than the figure given above.

The steel-melting is so conducted that a good steady heat is kept in the furnace during the process, in order to get the steel, if possible, entirely free from gas at the time of tapping without too high a percentage of silicon—that is to say, so that the ingots may be solid and free from blow-holes, without too much tendency to pipe.

If the steel is coming from the furnace too hot, so that piping is to be feared, it is either kept long enough in the ladle to sink to the proper temperature, or the so-called "De Laval" heat rings are used. These are iron rings lined with fireproof material heated to a very high temperature, which are placed on top of the molds; and, in casting, are filled with steel, which remains melted in them, and sinks until the ingot below the ring is entirely solidified.

Probably the danger most difficult to avoid in the making of hard steel is getting it too hot, which renders it liable to surface blow-holes. It has been found, however, that such blow-holes are formed only when the melter, at some time during the process, has let the furnace become so cold that the molten mass has taken up too much gas, and afterwards has attempted to repair this fault by forcing the temperature at the end of the heat. Under proper discipline, the tapping of such steel has, therefore, become more and more rare.

In the manufacture of steel for castings many difficulties had, at the outset, to be overcome, because the furnaces used in Sweden were not suited to the business. They were made very shallow, in order to permit the pig-and-ore process to be operated with rapidity—that is, the furnace was very long and wide in proportion to the size of the charge. This caused, in the making of steel for castings, too quick heats, with too much liability of the metal to take up a large amount of gases, and also, after the addition of ferro-silicon, too much oxidation of the silicon before it has had time to be dissolved in the bath.

At the steel-casting works—all of which make soft steel also—it is necessary to select a middle course, and to increase the depth of the hearth (thus extending the duration of the heat), although it is not increased sufficiently to get the ideal of a furnace for steel castings, because the hearth would then be entirely unfit for the production of soft steel. It follows also that to make steel castings of perfect quality, it is necessary to maintain a very high temperature in the furnace during the melting—that is to say, so high that the metal never becomes free from silicon, whereby the absorption of gas is resisted. For this reason the furnaces are much more severely strained in this manufacture than in making steel to be rolled, and they do not last half as long.

Another result is that the steel has always to be tapped a little too hot, although protection against overheating is provided in the charging of the relatively cold ferro-silicon, near the end of the operation. This excessive heat, however, is of use in the manufacturing of small castings, and for large ones the steel can always be let stand and cool in the ladle. In casting small pieces it is kept hot enough to be tapped from the big ladle into crucibles or hand-ladles, and from these into the molds, whereby a finer surface is obtained, because the metal is not poured in such a heavy stream as to detach loose particles from the surface of the mold.

A Miniature Locomotive.

The London *Industries and Iron* reports that a short time ago Messrs. Bagnall and Co., Limited, of Stafford, built a locomotive which is unique in its way. The utility of employing steam locomotives on estates to carry about half a dozen persons was demonstrated by trial trips on a temporary line of eighteen inches gauge. The locomotive in question was built for use in a gentlemau's park, and runs on light rails ten and twelve pounds per yard, fixed to sleepers with automatic fish-plate joints. The engine has single driving wheels with leading bogie wheels and tender, and measures about three feet four inches to the top of the boiler. It is employed with a neatly finished open carriage capable of accommodating six persons. This has three cross seats, each for two persons, and is protected by a canvas awning. At the rear a miniature brake-van is coupled. Such a train can be run at from twelve to fifteen miles per hour, but on long tracks a speed of twenty-five miles can be obtained. Such a railway can be laid with great facility, and on fairly even ground a portable line, one mile in length, could be laid by four men without much exertion. A temporary road of this kind is of use for industrial purposes with tip wagons.

The engine is a perfect miniature of a passenger locomotive complete in all its details. It is capable of hauling a load of about five tons on a gradient of one in ninety, and, as a high speed can be obtained with safety, such an engine may be found useful for light passenger work on narrow-gauge lines or for purposes of inspection. It has cylinders four inches diameter by six and one-half inches stroke, the driving wheel being thirty inches diameter, and is suitable for lines of portable railway laid with rails weighing ten pounds per yard to an eighteen-inch gauge. The engine weighs about two and one-half tons in working order.

It has been said of the prototypes of this locomotive that "their majestic proportions have always excited the admiration of engineers. It would be difficult to name many types which have lived so long, and which comply so fully with the heavy demands of an exceptionally fast traffic." As our readers may care to possess the leading particulars of a class of locomotives which have earned such high praise, we give the same herewith: G. N. R. express passeuger engines—Cylinders, 18 inches diameter by 26 inches stroke; driving wheels, 8 feet diameter; steam pressure, 140 pounds; tractive effort, 94.5 pounds per pound of cylinder pressure; boiler, 4 feet diameter, with 174 tubes, each 1¾ inches diameter; heating surface, 109 square feet in firebox, 936 square feet in tubes, making a total of 1045 square feet. The gate area is 17¾ square feet; the bogies have wheels 3 feet 11 inches diameter, and the trailing wheels are 4 feet 7½ inches in diameter. The load on the bogie wheels is 8 to 12 cwt., on the trailers 10 to 12 cwt., the total weight being 45 tons 3 cwt. The tender is carried on six wheels 4 feet 1½ inches diameter, and holds 2000 gallons of water, or sufficient for a run of 105 miles without a stop, such as the run from King's Cross to Grantham. Five tons of coal are also carried. The total wheel-base is 29 feet 6 inches.

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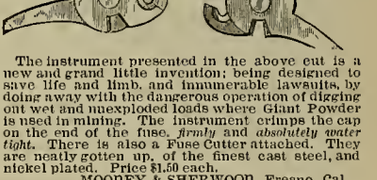
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GOVER.—*Republican:* Very little is known concerning the status of the litigatiou between the Gover mine and its creditors. The old electric pump is being repaired and a new pumping apparatus is being put in. The insolvency proceedings in San Francisco have been further continued for sixty days. The creditors do not seem to know whether the present operation in fixing the pump, etc., are being doue by virtue of the agreement entered into between the Gover Compauy and its creditors, according to which a stay of proceedings was guaranteed by the creditors for three years. The creditors consider that that agreement is null and void, inasmnch as its conditions have not heen complied with hy the company.

MISCELLANEOUS.—D. Cutmann and others connected with the Alma were in Jackson during the past week and completed the purchase of three acres of land, being the western portiou of W. P. Peek's town lot. The land is believed to be in the direct line of the main belt, and has been purchased for mining purposes. They bonded the tract several weeks ago for $1000, and this week they plauked dowu the full purchase money and received a deed. The same company has also bonded three or four acres of the Jones ranch, beiug the coutinuation of the line of the mineral lode to the north. With the Alma this gives the company the control of abont half a mile of the maiu belt. They are pushing work ou the Alma, putting up good machinery, and everything indicates that they are going in for a thorough prospecting of their claim.

The Truckee Lumber Compauy, who owu the Vaughn claim, in Hunt's gulch adjoining the Kelly mine on the east, have let a coutract to sink 100 feet on that property.

THE BAY STATE OF PLYMOUTH.—Amador *Ledger*: At the Bay State the shaft is down 615 feet, and 650 is the place where they expect to discontinue sinking and go to taking out ore and crusbiug it in the mill which will be in readiness to work within thirty days.

THE EXTENSION OF PLYMOUTH.—The Extension Miniug company has its shaft down 48 feet and is still at work with good prospects. Mr. Chisholm, who is in charge of the company's work, went below Monday to consult with the men who are putting up the money for the work. He is employing five men.

THE PIONEER OF PLYMOUTH.—Dr. Boyson has about thirty men at work in the Pioneer mine; he is now crosscutting to the ledge matter from the 400-foot level. During the past few days he has encountered strata of high grade rocks which serves to indicate that he is rnnning to a fine body of ore. His mill which has 20 stamps is in condition to run. He has water to run it wbich has a 586-foot pressure. He has a large quantity of ore on hand and will start up the mill in a short time.

THE MEDIAN OF AMADOR.—The Median rock is being crushed at the South Spring Hill mill, ten stamps being in constant use. The old blanket plant of the South Spring Hill has been repaired and is being used to catch the slimes from the Median crushings. The rock is coming from the 200 level.

THE LUCILE OF PLYMOUTH.—The Lucile, formerly the New London, has forty meu at work. The shaft is now cleared and retimbered iu the neighborhood of one huudred feet. In a short time they expect to reach the water level and hope to find the shaft opeu and in good coudition to the bottom of the old works. A number of meu are at work retimhering the oid forty stamp mill and puting a new roof on it. The uew hoist will he completed in a few weeks and then if the old works are in good condition, as soou as the water is out and the ledge opeued up, work at the mill will he commeuced. Supplies are on hand for a continuous run throughout the winter. They will put in an electric plant for lighting purposes.

PIONEER DISTRICT.—S. D. Wicks is having a quantity of ore crushed at Gracey's mill.

Mr. Kimhall of the Dead Sbeep mine in Pioneer district has just had a crushing of rock through the Gracey mill which turned out very fine indeed.

W. Q. Mason, whose mine is in Pioneer Creek, has a three foot ledge in his tunnel and the ore is very good. The generally encountered ledge in this formation which is granite is but a few inches, seldom exceeding twenty-four inches. The strike of a three foot ledge of good ore is almost phenomenal.

THE VAUGHN & KRUGER JACKSON.—Mr. Champion, a Westeru mining man, who with several partners years ago filed upon the above named property, near Middle Bar, was in the towu a few weeks ago and let a contract to sink upon the property 100 feet. He says he intends to follow this up until he thoroughly prospects the property. Mr. Champion is now the sole owner of the property having succeeded to his deceased partner's interest by purchase.

THE SANDY BAR OF JACKSON.—H. F. Vogt has just returned from San Francisco. He is now in charge of the Sandy Bar Mining & Milling Compauy as superintendeut for the owners.

THE BRIGHT OF JACKSON.—This property which was bonded to the Reichling Bros. a short time ago aud by them placed in the hands of a company to prospect and develop, awaits the cancellation of a former hond to N. A. Bradley and others which was practically given up, hut which requires action to that effect by the company which is almost in a state of collapse. It required some time to reconstruct the company so official action could be had, but it will be affected next week.

Butte.

WORK COMMENCED.—Forbestown *New Era*: Work has been commenced at the Denver mine. The tunnel which was started a short time before the mine closed down will be run to the ledge. Air compressor and Burleigh drills will be used and the work pushed as fast as possible. This tunnel will tap the ledge at a depth of nearly 900 feet, and about 400 feet below all previous workings.

RICH PROSPECTS.—Oroville *Mercury:* George Fiuch was down from Forbestown yesterday and in conversatiou with a *Mercury* reporter told of the rich quartz prospects that he is developing. He is interested in two extensive ledges on the north side of the South Fork or Feather river, opposite Forbestown. He had with him a uumher of beautiful samples of ore, showing rich in free gold and bigh grade sulphurets. The ledges are of recent discovery and of great extent, and development work is being pushed on both of them. In one of them E. Ellsworth is associated with Mr. Finch in the ownership. It is on the average six feet wide and assays show the ore to go $10 free gold, $180 in silver and the sulphurets $300 per ton.

The other ledge is owned by Mr. Finch, Sam Titus and L. C. Jacobs and averages thirteen feet in width. The ore assays $29 in free gold and the sulphurets $300 per ton.

The ledges cau be traced for miles and Mr. Finch and his partners have every reason to bolieve that they have a bonanza.

Calaveras.

BISBEE.—*Mountain Echo:* The Bisbee mine situated near this town is making an excellent showing. The shaft is sixty-five feet deep. The ledge is twenty-five feet wide, and the ore carries free gold and a large per cent of rich sulphurets.

PROSPECT.—Geo. C. Turner is gettiug some good prospects in bis mine near Smith's Flat. Mr. Turner has a good mine, and the time is not far off when it will he sought after hy men of capital who will develop it.

It is reported in Angels Camp tbat a rich lode of gold-bearing quartz has been discovered at Murphy, and that the vein is twenty-five feet wide and the ore pays $7 per ton. It is to be hoped that the report is true.

GOOD ORE.—Calaveras *Chronicle:* The Seeman Bros. mine, which is situated near Railroad Flat, is turning out some good ore. The shaft is uow down to a depth of forty-five feet. There are five parallol ledges, running east and west, the main ledge being about two and a balf feet wide and prospects at an average rate of $12 per ton. The Seeman Bros. have a cabinet of specimen rock, that they have takeu from the mine, valued at $1000.

El Dorado.

CHURCH MINE.—*Mountain Democrat:* Operations at the Church miue have been suspended for a week or so, owing to the twisting off of the piuion shaft. Besides the loss which will follow the temporary closing down of the mill, the repairs will cost the company $1000.

Lassen.

HAYDEN HILL.—Cedarville *Record:* Hayden Hill, lying about 15 miles south of Adin, in Lassen county, is destined, we thiuk, to be one of the liveliest and most prosperous mining camps in Northeru California. The claims being worked there now are the Golden Eagle, Evening Star, Blue Bell, Brush Hill, Providence, Juniper, and Dale's claim, all of which are yieldiug a fair quantity of good paying ore, the rock assaying from $10 to $40 per ton of free milliug ore. More real prospecting has been doue there during the past year than ever before, and the prospects are better.

At the southern point of the Hill the Big Valley Tuuneling Co. have run a tunnel into the hill to a distauce of 1,000 feet, and are driving it right along with the intention of tapping the main ledge at a depth of 1,500 feet below the surface. Several veins of good quartz have already been cut through, hut work is heing pushed on to reach the center of the mountain, where it is expected the "mother" lode will be tapped. The projectors of this enterprise certainly deserve much credit in pushing the work ahead, and from indications now reported, they will soon be taking out the yellow ore.

Mono.

A BRIGHT OUTLOOK.—Bodie *Miner:* Without exaggerating in the least, it can he said that Bodie's outlook is brighter than for years past, and the old camp will continne to produ e hullion in large quantities for years to come. The successful operation of the Standard Company's electric plant, hy which the cost of milling has been considerably reduced, has been and will continue to he an item of great importance in the town's prosperity. By the introduction of electric power in mining and milling, it will he possible to work ores at a profit which heretofore would not pay. It is well-known that there are thousands of tons of low-grade ore here that will eventually he made to yield a profit, and is it visionary to look forward to a time when a big electric plant will be put up to provide power for working mines which have long heen idle and for some now heing operated on a small scale? Not at all; and, in fact, those best informed confidently predict that within the next year something in this direction will he done. The Standard is now putting in a dam across Green creek to seenre water enough to develop power sufficient to run the mine as well as the mill, and when this is done a still further reduction in the cost of miniug and milling will he accomplished.

Nevada.

AN IMPOUNDING DAM.—Nevada City *Transcript:* The work of building a dam for the Omega Mining Company at Omega has been commenced on Scotchman creek. It is to be built of timbers, brush and dirt, and will he the largest of the kind ever constructed in the couuty. A representative of the Debris Commission will superintend the work. When the dam is built the company will be permitted to resume operations in their hydraulic mine.

CENTENNIAL.—Nevada City *Herald:* Work on the contract recently let for running a crosscut in the Centennial mine is being pushed vigorously. Two shifts are being worked. The object of the crosscut is to intercept the rich gravel developed about the 1,500 station of the main tunuel, so as to work it to better advantage. The Centennial people are persevering, and everybody hopes they will be richly repaid for their big outlay in developing this mine.

THE REWARD.—Nevada City *Herald:* A tunnel to drain this mine to a depth of 500 feet is being run, and will soon be completed. The company have a good ledge, and they are quite satisfied as to its paying qualities when it is properly opened. It is owned by old operators in this district, who deserve success. Men who stand by a mining district through thick and thin deserve the highest consideration from those who are depending upon the success of the district for a livelihood. The vicissitudes of mining are many, and it is not always those, who, from the expenditure of money, energy and intelligence, deserve most, that receive the highest rewards. Sometimes the lucky man is the novice, and yet, in general, those who persevere succeed.

THE MERRIMAC.—Nevada City *Transcript:* Active work was recently commenced at the Merrimac mine out near Kitts' ranch, on the line of the Narrow Gauge Railroad. This mine was worked a number of years ago, and some very fine quartz was found there, but for some reason operations were suspended. A company with abundaut capital has now got hold of the property and intends to thoroughly open it. L. P. Goldstone is the superintendent, and he has instructions to have all work performed as expeditiously as possible. A station is being cut at the depth of 500 feet, and the running of drifts will be commenced as soon as possible. After the mine gets in operation, and rock is being taken out, the company intend putting up a mill. It is the opinion of mining men that the Merrimac will prove a valuable property and that its development will be the means of inducing capitalists to come in and take hold of other mines in that vicinity which are now lying idle and which it is believed need only to be worked systematically in order to put them on a paying basis.

NEW HOISTING WORKS.—Nevada City *Herald:* The new hoisting works on the Contact miue is now in course of construction, and will he quite a commodious structure. Some splendid timbers were hauled out this week by M. L. and D. Marsh to mount the machinery on.

Placer.

A PROMISING MINE.—Colfax *Sentinel:* A new Cuttenberg mill has lately been erected at the New Golden Rule quartz mine at lower Horseshoe bar, six miles south of Newcastle. A 300 foot drift has been run, the greater portion of it on the ledge. Twelve men are employed and the rock is beiug milled with good results. This ledge is on the opposite side of the American river from the famous Zantgraf mine, and is no doubt an extension of that ledge.

AT WORK.—Colfax *Sentinel:* Superintendent W. H. Grenell, of Bath, informs us that things are prosperous at the Breece & Wheeler mine at that place. About thirty meu are employed.

Hon. C. F. Reed has resumed work at his Gold Blossom mine at Ophir. A boarding house has been built and he will soon erect a mill.

OPHIR.—Placer *Herald:* The Boulder seems to keep her end up so far. Mr. Haudy is working a very small force of men at present, but seems he makes it pay.

The Hathaway mine is working at full blast. Quite a large force of men are at work and every thing looks as though this mine would not shut down for a while yet.

CENTENNIAL.—The Centennial mine at Butcher Ranch belonging to George Chesehro, was hid in at sheriff's sale last Monday by the Rico State Bank.

San Diego.

RICH ROCK.—Los Angeles *Times:* Developments in the mine of W. A. Hayt and A. S. White in San Diego county, near Warner's ranch, show a fine body of rich ore, varying from $40 to $300 per ton. There is talk of putting a mill there.

Shasta.

NOTES.—Redding *Free Press:* The Lost Confidence mine, at Iron Mountain, got up steam Tuesday morning, and will keep up a steady grind until February, crushing between seventy-five and eighty tons per day.

At the Hidden Treasure a few repairs are heing made on the buildings, preparing for winter rain and snow.

The Minnesota people on Spring creek are making a 700-foot upraise from the face of the tunnel to the surface.

Bullard & Vandeveer are putting their arrastra in shape for a good winter's work.

Work is heing done on the Red Rock mine, near Copley. They have two feet of rich copper ore carrying gold.

Col. Jack Stowell is waiting for silver to raise before doing any further work on his mine.

Pat Rohn's Indiana mine, near Copley, is heing experted, pending a sale. It shows a well defined four-foot ledge of $15 fine milling ore.

At the Balla Klalala the new ditch is nearly completed; all the tunnels on the mine are cleaned out and ready to stope ore.

At Wbiskytown the property heing worked hy Hunt & Jones has developed some rich ore. The water was too mucb for the whim and a twenty-horse power hoisting engine will be put on the mine next week.

The Riley mine, on Squaw creek, is being opened up ready for inspection; considerable timhering is necessary. A deal is pending, so it is understood.

Most of the seam miners in the Whiskytown district report good success during the past summer.

All kinds of rumors are afloat about the Gladstone at French Gulch starting up, but nothing definite can be learned.

Mr. Graham, the millwright, has charge of the erection of the mill on Jack Conant's American mine on Kline gulch, and it will be running in about six weeks.

At Old Diggings the Texas Consolidated new bonanza is all the talk. Miners agree that it is the finest body of ore in the county. They have drifted on it three weeks and the pay still continues.

The Central mine, under the superintendency of A. A. Anthony, put a force of men at work again this week.

The Kosciusco, at Quartz Hill, shipped a bar of bullion to Chicago last week valued at $5000. The late rains broke the ditch, causing the mill to lie idle one day.

Sierra.

POCKETS.—*Mountain Messenger:* Jerome York and the Wilson boys found another pocket last Sunday. They took about $200 out in a few hours. It is gettiug to be a common thing now to have the boys bring in $200 or $300 for a day's work. They have found a good many pockets this summer, but there are still many more in the country awaiting the pick of the prospector.

Wilson Hovey of St. Louis called on us last Thursday and reported the Grass Flat and Riffle mines doing finely. Six men are working two shifts at the Excelsior. Hendel and Packer are working thirty men on Slate creek. J. Moyle has paid off all his indebtedness to the men and other parties, and work has been temporarily discontinued.

BUTTES SADDLE.—*Mt. Messenger:* The machinery for the tramway of the Buttes Saddle Co. arrived this week and will be immediately put in place. An upraise is heing made from No. 1 to 2 tunnel for air. The mill will be started about the middle of October.

BORING.—Mr. Robley and a crew of men are still engaged in sinking a prospect hole with a boring machine on the St. Charles Hill Mining Company's ground. Last Tuesday they were drilling through a hard lava boulder. At that time they were down 122 feet and three-quarters of an iuch. The water bothers them considerably but so far they bave been able to handle it. They expect to have to sink twenty-five or thirty feet before they reach bedrock.

BULL OF THE WOODS.—Plumas *National-Bulletin:* Early in the summer we mentioned the fact that Major Michael Mason had a very rich quartz development known as the "Bull of the Woods," situated near Haskel's Peak, in Sierra county, and about three and a half miles southeast of Gold lake, a body of water famous in the pioneer history of this part of California. The mine is at an altitude of about 7900 feet. Major Mason, J. C. Knickrem, N. Frayer and two other gentlemen each own a one-fifth interest in the property. Recently a shaft was put down forty feet heside the vein aud a crosscut into ore made. The ledge is estimated to be thirty feet wide. Previously Major Mason had run a tunnel 136 feet lower than the shaft to tap the lode. This was driven in 600 feet and to within 115 feet of the shaft. The body of ore is said to be immense and is considered to be on the "mother lode" of that county, of which the Young America mine forms a part. About two feet of the vein next to the hanging wall is a very peculiar ore, embracing galena and copper-silver glance. The owners think it is fabulously rich and confidently assert that it will produee from $50 to $60 per ton.

On Monday, Messrs. Frayer and Knickrem purchased the Huntington mill at the Bushman mine, near Quincy, and are moving to the "Bull of the Woods." They will push work on it, and they expect to have it in operation in about three weeks. The property is only a few miles south of Mohawk valley.

Siskiyou.

GOLD.—Yreka *Journal:* Last Friday B. G. Reeder and A. B. Jenkins called at this office and exhibited to us two ingots of bright gold, valued at $2000—one of $1200 and the other $800, made from gold taken out of a quartz ledge at Fool's Paradise district, between the Anderson grade and Shasta river, south of the Klamath river. Seventy-one pounds of quartz, washed clean, was pounded up in a mortar from the ledge and assayed $1,709.92, at rate of $18.875 an ounce. This is about the richest quartz district in the county, hut the ledges are supposed to he pockets, and no mill will he put up until the certainty of a permanent ledge is assured hy further development.

P. Kiernan has a force of men at work tunneling to his ledge in the Butteville district, west of Igerna, expecting to strike the ledge soon. A hody of hlue rock about three feet wide hetween regnlar walls has been found at the surface, which is helieved to be the upper portion of a well-defined quartz ledge. Other owners of ledges in the same district are waiting to see what Kiernan's mine develops in the way of gold-bearing quartz.

Trinity.

CHLORINATION.—Redding *Free Press:* Hart's sulphuret ore in his Bullichoup property is heing worked by the chlorinating process. Glen Hart is doing development work on the extension to the Orient and Occident in the same district.

At Trinity Center the Shoemaker combine was offered $90,000 for their property hy Captain James of the Uncle Sam mine. The offer was declined.

Late advices from Cinnabar indicate that

the Altoona will get their furnaces and pumps in readiness for a winter's campaign. The masons are making rapid progress with the furnaces.

Reports from Junction City, Trinity county, report iron pipe for the French company's hydraulic mines, piled up everywhere and being put in place for winter's work. Over 150 tons of pipe have been received thus far. Hydraulicking will begin with the first rains.

A GOOD CLEAN-UP. *Journal:* This week Grant Day brought in a bar containing $1200 as a result of crushing about 100 tons of ore from the Enterprise mine in the East Fork district. The mine is looking first rate, there being a good body of ore in sight.

Tuolumne.

SEMINOLE. *Calaveras Democrat:* We are pleased to note steady and positive progress of the Seminole Consolidated Gold Mining Company of New York, the directory of which in this county consists of Commodore Shaver, president; Col. Jack Coles, manager; Mr. D. H. Coles, secretary. The group of mines recently purchased by this company consists of Young America, May Flower, Georgia, Buckeye, Lena Bell, Seminole and Worcester. This group commences at the southerly boundary of the Lady Washington mine and runs northerly a distance of over 8,000 feet. Col. Coles has one mill of ten stamps in operation crushing ore from the Seminole mine, and the results of the crushing are very encouraging. The sulphurets of this and all the mines assaying not less than $40, and as high as $250 per ton. Free gold is clearly visible in the ore from every mine. In the spring the Colonel and management intend building two new mills of thirty stamps each. The ore for said mills is to come from the Worcester, Buckeye and Lena Bell. The ore will be conveyed to the mills by tramways.

The Bonita, Providence and Consuela mines on the south fork of the Tuolumne river are being retimbered preparatory to active operations.

The Eureka mine at Summersville at a depth of eleven hundred feet has developed ore that pays $200 per ton.

Messrs. Ed and Wm. Hensley of Whisky Hill, have, with characteristic energy, gone down into the depths of the Little Gem mine, once supposed to be worked out, and after six months have developed a rich chute and taken out 200 tons of rock of fine quality. As soon as water comes they will start the mill of ten stamps.

The Crystalline mine near Jamestown, owned by Chancey Wetmore and Daniel Secber is now showing well. These enterprising gentlemen have taken out 400 tons of pay rock, and as soon as water runs will start the mill of twenty stamps to crushing.

The Golden Rule mine south of Quartz mountain is being re-timbered and put in order for vigorous operation. Conjunctively with that work a long tunnel is being run which will tap this heretofore wonderful mine at a great depth.

Mr. Alex. McDonald of the Hyde mine above Sonora, reports that their mill of ten stamps is running steadily day and night on good pay ore. The main shaft is down 450 feet. The lode at that depth is sixteen feet wide. The operations at the mine are of a vigorous character and twenty men are constantly employed.

SOLD.—Tuolumne *Independent:* The Crystalline mine is sold on a six months' bond. A deposit of cash has been paid, balance of purchase money to be settled within the above time. The Crystalline is situated on the mother lode, south of Table Mountain and the Alabama mine, which it adjoins. The Crystalline is a double property, being 1200 feet wide and 1080 feet in length; has a fifteen-stamp mill, with numerous other houses on the property, all enclosed by wire fence. There are two tunnels entered, one at the south and one at the north end of the mine, but in neither case have the main lodes been intersected. This will probably be the first work to be accomplished. The croppings on the mine are very bold.

NEVADA.

Silver Star District.

THE FIRST GOLD BAR.—Walker Lake *Bulletin:* Last Friday a bar of gold bullion valued at $1000 was shipped from Silver Star to the Mint. This is the result of the first cleanup of the new mill. We are not informed how many tons of ore were worked, but it is believed that not more than fifty tons were put through, and most of this was known to be of low grade. It was put in as a starter for the mill. We have heard a good deal about the first gun of the campaign, but this is the first gun of the Silver Star mining district, and it is of vastly more importance to our people than forty campaigns. The mill is a success. The water supply is said to be sufficient. Several valuable mines are exposed to view, and if Silver Star does not hum with life and activity within three months, all signs will fail.

Washoe District.

SAVAGE.—Virginia *Enterprise:* On the 1100 level in the north lateral drift, started from the east drift, they continue to extract ore on the sill floor upward to the fifth floor. The south drift started from the face of the north lateral drift, was advanced ten feet; total length fifty-one feet. Face in quartz giving some fair assays. During the week we have hoisted fifty-seven cars of ore. Car samples averages $23.40 per ton. On the 1050 level the south drift started from the east drift thirty feet from the south ore slopes was advanced nine feet; total length thirty-seven feet. Face is in quartz giving some assays. The west crosscut started thirty feet north of the south boundary was advanced ten feet; total length fifty-eight feet. Face in quartz and porphyry. On the 1100 level the north lateral drift from the station was advanced eight feet; total length 359 feet; face in clay, quartz and porphyry. They are cutting out on the west side of the drift to upraise and sink on the ore mentioned in last weekly report.

POTOSI.—Crossent No. 5, started from the south drift, 450 level, was extended seven feet; total length eighty-one feet. Face is clay and porphyry. A major portion of the time was occupied in repairing where necessary in the south drift.

We have started a winze from this south drift, 200 feet south of the main line, on the ore streak cut in running the drift. It is down seven feet and the bottom shows a width of about two feet of ore giving fair assays. At the croppings the northwest drift from the shaft has been extended a total length of forty-four feet; face in low grade quartz and porphyry.

CROWN POINT.—On the 600 level we have started a north drift from the main east crosscut and are out ten feet; face in quartz with bunches of porphyry through it and yields assays from $6 to $8 per ton, nearly all gold. Have extracted from the stopes below the 700 and 600 levels and from the openings above the latter level during the past week, 412 tons and 1180 pounds of gold ore which has been shipped to the Mexican mill for reduction, the average battery assay of which was $8.55, of which $7.58 was gold.

S. N., M. & U. SHAFT.—The east crosscut from the north lateral drift, 150 feet north of the west drift, 1520 feet west of the shaft, 900 level, has been advanced during the week twenty-four feet; total length, 120 feet; face in quartz, clay and porphyry.

The west crosscut from the Union Con. south lateral drift from the west, 1520 feet west of the shaft, 900 level, has been extended twenty feet during the week; total length, 122 feet; face in clay and porphyry.

UNION SHAFT.—East crosscut from the north lateral drift, 450 feet north of west drift, 1520 feet west of shaft, 900 level, has been advanced during the week twenty-four feet; total length 120 feet; face in quartz and porphyry. The west crosscut from Union Con. south lateral drift from west drift, 1520 feet west of shaft, has been extended twenty feet during the week; total length, 122 feet; face in clay and porphyry.

BELCHER.—Twenty tons of fair-grade ore were hoisted during the past week.

SILVER HILL.—During the week we have sunk the winze eleven feet; total depth forty-five feet below the fifty level. From the bottom of the winze we have started a drift south on the ledge, which is now out five feet; face shows three and a half feet of ore assaying from $15 to $20 per ton.

SIERRA NEVADA.—The northwest drift at a point 160 feet west of the mouth of the Layton tunnel, is out fifty-five feet; advanced forty-five feet during the week; face in porphyry and quartz.

The east crosscut No. 1 from north lateral drift No. 2, at a point 140 feet north of intermediate tunnel, is out thirty feet; advanced eighteen feet during the week; face in quartz and porphyry.

CHOLLAR.—The upraise from the west crosscut thirty feet south of our north boundary line, 450 level, has been carried up a total distance of thirty-three feet, where the pay narrowed.

On the 555 level the main north drift has been cleaned out and retimbered fifty feet for the week.

Repairs to the 650 level station are approaching completion.

WARD COMBINATION SHAFT.—The west drift from Ward shaft, 820 level, was advanced ten feet during the week; total length, 1152 feet; face in soft porphyry with a slight seepage of water.

BULLION.—The west drift from the Ward shaft, 820 level, has been extended ten feet during the week; total length 1132 feet; face in soft porphyry and clay with a slight seepage of water.

ALPHA.—During the past week have cleaned out and retimbered fifteen feet of the shaft below the 382 level; total depth of shaft cleaned out and retimbered, 402 feet.

OREGON.

BAKER COUNTY.—Bedrock *Democrat:* More development work has been done on the mining properties during the present year of 1894 than at any other time in the history of Baker county, and the work thus prosecuted has been attended with good results in placing before the eyes of the outside world properties that will pay big dividends on the capital invested in their operation. Men of wealth are becoming interested and taking hold of our mines with the intention of erecting works for the proper treatment of the ores. A great many of the properties discovered and developed this year are bonanzas, the rock carrying free gold and many assays made running up into the thousands of dollars.

The great amount of development work done on mining properties the past spring and summer will, we predict, be amply rewarded during the coming spring and summer of 1895 by the investment of a large amount of capital by men of wealth who have an eye on Baker county mines and who are eager to invest in developed properties, and thus place this rich mineral belt where it properly belongs as the best bullion producing camp in the west.

A LUCKY FIND.—Johnny Hughes, of Susanville, made a lucky find not long since within the mineral belt of Susanville, which is pronounced by all old-timers to be an extension of the famous Cabell mine.

The ledge discovered is in range with the one on the Cabell property, and the ore resembles it very much in every particular. Mr. Hughes is at present engaged in driving a tunnel on the property. The ore taken out is very rich, gold being visible to the naked eye in a great portion of it.

A TRIP TO THE MINES.—Jos. A. West, superintendent of the S. V. R. R., returned yesterday from a trip to the Greenborn mountains and gives a glowing account of the mining interests in that section. The mines are being worked to their fullest capacity now, owing to the cheap rates given by the railroad company of $6.75 from McEwen to Tacoma and Everett, Wash. With this rate the mine owners can now realize a profit from their ore shipments and it gives a new impetus to the district.

BRITISH COLUMBIA.

MINING DEVELOPMENT.—Kamloops *Sentinel:* The year 1894 has been remarkable as the one in which more advancement in mining has been made in British Columbia than during any year of the past. What were but prospects in the Kootenay have become mines, and ore is being shipped regularly and in large quantities. In southern Kootenay both quartz and hydraulic claims have been developed, while the quartz claims of the south Okanogan have become producers. Several hydraulics are working successfully in the Fraser river valley, while others have been put in order for next season's work. Preparations have been made for dredging the Fraser and Thompson rivers, and these plants will be in operation early in 1895, if not before this year has expired. Work has also been done in Big Bend and Similkameen, and the Kamloops district has not been behind with a shipment made of silver ore from the Homestake, and the Glen Iron mine is likely to resume. Next year will probably see the output of precious minerals from this province almost, if not quite, equal to the largest yield recorded. It seems quite apparent that the second era of British Columbia prosperity is just commencing.

ALASKA.

BERNERS BAY. Alaska *News:* At the mill and mines of the Berners Bay Mill & Mining Co. all is activity and bustle. The lumber for the addition to the mill to make room for a battery of 20 additional stamps has been sawed at the company's mill and transported to Seward City. The building for the steam air compressor at the mill is under construction, and the house for the water compressor to run the Burleigh machines at the Comet mine will also be built this month. Thomas S. Nowell, president of the company, intends to hurry work so that the mill's addition and enlargement of the battery will be completed by December 1st. Work is progressing on the 450-foot tunnel to tap the Bear, Opbir and its group of mines. The boarding house at the Comet mine, 25x50 feet, is completed, and the men have moved into their new quarters. The Rustler left Monday with the scow Onyx loaded with the twenty stamps, dies and belt connections of the battery for Seward City. Mr. Nowell took a half-dozen of miners along to increase the force at work. The late clean-up at the mill from the Comet mine ore exceeds all previous ones and gives eminent satisfaction to the company.

Messrs. S. Bonnifield and Willis Thorp are pushing work on the Bennett mine in the Basin. They have now a Burleigh drill driving into their main ledge, and with every blast, the quartz is piled up in shape to be sent to the Ebner mill. They have been making a fine showing this season, and should the snow storms hold off for another month, their returns will amount to a good round sum.

Ore is being transported night and day from the Ground Hog mine to the Nowell mill at the rate of 150 tons every 24 hours. The mill is running steadily under the management of Ed. Callahan. Should the miners be able to take out ore this month, the mill will be supplied to run on ore during November and part of December.

Jack Arvey is making rapid progress at the three pits of the Takou Consolidated mine, and his force of thirty men is taking out quantities of well-mineralized quartz, which pans out very satisfactorily at the mill. He will take out ore as late as the weather will permit.

UTAH.

MARYSVALE GOLD STRIKE.—Salt-Lake *Tribune:* Mr. F. S. Mount of the Monarch Mining Company is in from Marysvale with reports of what is regarded as the biggest strike of the year in that locality. The strike was made about two weeks ago in the old tunnel of the Copper Belt mine. The company had been at work all summer on the tunnel, driving it in about 300 feet farther than it stood when closed down last year. At a penetration of about 500 feet a body of gold-bearing ore was encountered which assayed from $15 to $18 per ton, with very little silver. Up to the time Mr. Mount left Marysvale a few days ago the crosscut had not been completed, so it was impossible to estimate the width of the lode. Experiments are now being made as to the best manner of treating the ore. It seems hard, and may even require cyaniding. As soon as the method is determined the company will proceed with the erection of milling machinery.

MEXICO.

JESUS MARIA MINES.—El Paso *Herald:* Uncle John Tabor, brother of the Colorado ex-Senator, has been in town, en route from Denver to the Jesus Maria mines, 500 miles west of Chihuahua. He says that the mines are looking well, and the bullion output is from $150,000 to $175,000 per month for the district. It takes six days to reach the mines from Chihuahua, half of which must be traveled with burros and the road for the last half of the distance is mighty tough going. Mr. Tabor has a high opinion of President Diaz, whom he considers a wise and most excellent executive. But he fears an uprising in northern Mexico in case of re-election, as for some reason the Spanish dons do not like the present administration.

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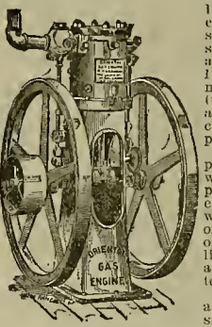

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THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Messrs. J. S. Gould and F. M. Spencer in the Holloway mine, near Gibsonville, Plumas Co., Cal., and to impound tailings behind log and brush dam in a ravine below the mine; from W. A. Morse in the Mugginsville mine, near Eureka North, Sierra Co., to impound tailings behind a cob dam in Eureka creek; and from John R. Jones in the Waukshaw mine, near Relief Hill, Nevada Co., to impound tailings behind rock dam in Logan canyon, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., on October 29th, 1894, at 1:30 P. M.

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Electrical Progress.

Direct Current Lighting at High Pressure.

The *Engineering Magazine* notes that one of the most unique and technically ingenious plans for lighting a town of moderate size which has come under its notice is that which has for the past two years been in operation in the university town of Oxford, England, and was described by Mr. Thomas Parker in a paper before the British Association. The conditions which confronted the projectors of this plant were by no means favorable to economical or profitable results, and no small credit is due the engineers by whom they have been so successfully met. In Oxford, the principal consumers are the colleges, and hence anything like a full load can only be obtained during term time. There is a maximum load for even half the plant only during some eight weeks in the year, and hence the system must necessarily be very elastic to be able to show even fair results. It was also necessary to locate the generating station at a distance of 4500 feet from the center of the area to be lighted, which of course compelled the employment of high pressure currents. After much consideration, a high pressure continuous current plant in conjunction with motor transformers and storage batteries was decided upon. At the power house the currents are generated at an e. m. f. of 1050 to 1100 volts, and are thence conveyed to a distributing station, through two pairs of mains insulated with India rubber, laid underground in iron pipes. Each motor transformer consists of a field magnet aud an armature with primary and secondary winding, having a commutator at each end.

The secondary mains are made up in two sizes in the form of armored cables. These are laid in a trench under the sidewalks, and are provided with disconnecting branch boxes, so that any section or street can be cut out. The high tension feeders to the transformers are of similar cable At present seven motor transformers are used in five sub-stations.

The storage battery at the distributing station is capable of sustaining a discharge of 120 amperes for eight hours, and takes care of the load from oue o'clock A. M. until half an hour after sunset. The battery is charged by a small motor generator, giving an output of 100 amperes and 33 volts from its secondary armature, being supplied from the secondary mains at an e. m. f. of 103 volts on its primary. The 33 volts from the secondary armature is put in series with the secondary mains, giving an aggregate of 136 volts, which is sufficient to charge the cells. This is found to be more economical than charging from the secondary mains with a regulating resistance, the total efficiency being 92.5 per cent. At the generating station three inverted triple-expansion condensing engines are employed, running at 125 revolutions per minute, and driving three separately excited Elwell-Parker dynamos, each having a capacity of 80 amperes at 1100 volts aud 400 revolutions. These are connected to bus-bars, so as to be run singly or in parallel as required. The "load-factor" of the station works out only 5.93 per cent. By this technical expression is understood the ratio of units of currents sold to units that could be sold with the lamps always on, viz":

$$\frac{\text{Mstered watt-hours x 100}}{\text{Mean watts installed x number of hours in the year.}}$$

For the greater part of the year only about half load for one engine is required, and in view of this fact the following results of the year's work from July 1, 1893, to June 30, 1894, must be regarded as quite remarkable. The aggregate kilowatt hours generated were 195,022, and the total metered 122,081, of which 18,303 were supplied for public lighting, and 2019 k. w. h. were used at the distributing station.

The total efficiency of the system was 64.6 per cent; that of the transformers 76.7 per cent, including loses in mains and resistances, and that of the battery 43.9 per cent. The total kilowatt hours unaccounted for were 6976 units, or not quite 5.5 per cent. Omitting this loss in computation, the coal used amounted to 6.43 pounds per k. w. sold, costing .752d (1.5 cents) per k. w. The number of 8 c. p. 35-watt lamps installed was 5060 at the beginning and 7774 at the end of the fiscal year. The The total cost of all generating expenses, including rent and taxes, was 3.715d (7.43 cents) per k. w. delivered to consumers. The total revenue for the year was £3715 8s. 2d., or approximately $15,000, the k. w. consumed averaging 18.2 per lamp throughout the year, for which the average price obtained was 7.3d (14.6 cents) per k. w. h. It is doubtful if another station can be found in the world of such small capacity and with such wide variations of load in different parts of the year, which can make so good a showing.

Electrical Equipment of a Luxurious Yacht.

The ocean yacht building at the Bath, Maine, iron works for Wm. Slater, of New York, might be called a gem if it were not for its size. In an electrical point of view it will be made, on occasion, a marvel of brilliancy. As to the boat in its appointments other than electrical, suffice it to say that $300,000, exclusive of furnishings, gives an idea of what a boat it may be. The electrical apparatus is on the same plan, the best regardless of expense. The plant, installed by J. A. Trates for the General Electric Company, consists of two 4-pole, 80-volt, 190-ampere direct connected machines, making 400 revolutions a minute. Sturtevant engines are used. At ordinary times one engine and dynamo will carry the whole load. For this purpose the circuits are arranged in a novel manner. The circuits feeding the lamps inside the vessel are connected to one machine, the search light, signal lamps and decorative circuits are on the other, when the main knife switches are down. If now a knife switch is pulled, the dynamo circuit is first broken and its load, when the switch is thrown way up, is transferred to the other machine. Before the change is made the total number of lights on all the circuits is reduced to the capacity of one machine. The wiring is concealed by specially designed moldings in some cases, but is generally put out of sight without that help. The bell wires are like the others, Grimshaw, and laid in the same manner with carefully soldered joints. The switchboard has two enameled rheostats by the Bridgeport Electric Company. There is a Weston station ammeter for each machine and a voltmeter. A novel featurc of the lighting of this yacht is two illuminating belts, to be used on the main boom and from the bowsprit over the masts. The search light has electrical connections through rings concealed in the base. The lamp can, therefore, be turned round and round without interfering with connecting wires. The illuminating belts of lamps and the search light will make the yacht a wonder by night as well as by day.

A British View of Our New Tariff Bill.

I have noticed "The American Tariff" as a headline in my paper every morning for weeks past. Sometimes it has headed a paragraph of a few lines only, and sometimes a column or more. I have many times tried to make out what it is all about, and what has really been done by the House of Representatives, the Senate, the Finance Committees, the Foreign Relations Committee, etc., and what would be the effect of Senator Murphy's resolution.

Now and again a leading article has appeared and I have hoped to gaiu some enlightenment therefrom. Usually, however, the writer of the articles has evidently been as much at sea in his deductions as I have been myself. The fact is that it takes a born American to understand the working of the legislative machine at Washington and to distinguish between bluff and business.

Having just had an opportunity of glancing at the bill for a few minutes, I hastily looked to see how it is likely to affect English electrical manufacturers. Nowhere, however, could I find anything concerning electrical manufactures. For instance, under the heading "Copper" there is given the tariff on sheet and bar copper, but wire is not mentioned. Under the heading of "Wire," iron and pianoforte wire alone are mentioned. There is no special heading for machinery, either electrical or otherwise, although steel ingots, forgings, boiler plates, etc., are dealt with. Electrical manufactures would, therefore, appear to come under the following clause: "Manufactured articles or wares, not specially provided for in this Act, composed wholly or in part of any metal, and whether partly or wholly manufactured, thirty-five per cent ad valorem."

Incandescent lamps will probably have to pay at the same rate; as, whether the minute piece of platinum which they contain is sufficient to bring them under the above clause or not, does not matter, seeing that "all manufactures of glass, or of which glass is the component of chief value, not specially provided for in this Act," are also subject to thirty-five per cent ad valorem.

Thirty-five per cent ad valorem is, however, a considerable reduction, as the present tariff is forty-five per cent. What the effect of this reduction will be, so far as concerns English electrical manufacturers, it is too soon to discover. It appears to me, however, that the reduction is not enough to be of any very material consequence. Certainly there is no ground for any great rejoicing.

Under the Act our American cousins will, for the first time, have the pleasure of paying an income tax, and, as a set-off against this, they have placed the following luxuries on the free list: Balm of Gilead, Bologna sausages, cider, old copper (electrical manufacturers please note), curling stones or quoits, and curling stone handles, dividivi, old junk, manna, sauerkraut, sausage skins, snails, yams and zoffer. —"Meteor" in London Lightning.

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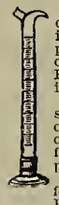

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Practical Information.

Soldering Aluminum.

Those who have occasion to use aluminum, either in their private experimenting or as a building material, for which, as it seems to us, it is destined to have many applications, may like to know how to solder it with the tools usually within an amateur's reach. As every one who has anything to do with aluminum knows, it is considered very difficult to solder. Ordinary solder when melted runs over it like mercury on a glass plate, and cannot be persuaded to stick to the surface of the metal by any of the usual methods. No flux known will help the matter any, for the reason that the oxide of aluminum which covers the surface is a thin film, is insoluble in any re-agent which will not attack either the metal itself or the solder. There are plenty of recipes, in accordance with which those who are willing to pay $1 a pound for "aluminum solder," and an extra price for "shop rights," may have the privilege of trying to make the "solder" stick to the aluminum, but amateurs will generally find it quite sufficient to use ordinary block tin for solder, and secure its adherence to the surface of the aluminum by rubbing the metal through the solder, which is melted upon it by a spirit lamp or a Bunsen burner, with a wire brush, which removes the oxides so effectually that the melted tin can be spread over the aluminum almost like paint. The best brush to use is one made of bits of aluminum wire, wound with wire or set in a handle, but steel or hard iron wire will answer. After both the surfaces to be united have been "tinned" in this way, they are held together and heated until the tin melts. The joint is so strong that the aluminum will sometimes break before it will separate from the solder; and, as block tin is very fusible, the work is easily managed by amateurs. Ordinary plumbers' solder, which contains a large amount of lead, should not be used. Lead has a curious repulsion for aluminum, and, although solder containing it can with difficulty be made to attach itself, by means of the wire brush, the joint would be unreliable. If it is desired to harden the solder, silver may be added. It will dissolve readily in the melted tin, and the resulting alloy, which is harder and somewhat less fusible according to the proportion of silver than the pure tin, can be spread with the wire brush with the same facility.—Engineer and Iron Trades' Advertiser.

The Removal of Iron Parts Shrunk on Hot.

A method for instantaneously removing iron parts shrunk on hot, like a crank on a shaft, has been communicated by M. Raffard to the Bulletin Technologique of the French Societe des Anciens Eleves des Ecoles Nationales d'Arts et Metiers. An endeavor had been made to take off the outer hoop of a Laval turbine by heating it with a gas blowpipe; but the heat was communicated too quickly throughout the whole mass to give a sufficient difference of expansion in the hoop alone, so as to loosen it, and there appeared no alternative but to cut it. In such a case, M. Raffard recommends that molten lead be run round the part to be detached—a method he applied with success in 1860 at the Soho foundry, Melbourne, in removing a crank that had been shrunk on a shaft eight inches in diameter.

The Passing of Red Brick.

In no department of human industry, says the Washington *Post*, has there been greater evolution of late years than in the business of making bricks. Formerly we had nothing but old-fashioned red brick that reached its climax of perfection at Philadelphia, and was shipped thence at great expense all over the country where a high-grade article was in demand. But the red brick has had its day for architectural use, and in its place has come to stay the brick of lighter hue—pink, buff, yellow, and, in fact, of nearly every shade.

A brick can be made that is as mottled as a sea-gull's egg, or one that will show the varying tints of an autumn leaf. It is done by adding certain metallic ingredients to the clay after the latter has been ground to the finest powder. It is the iron in the clay that gives the ordinary brick its deep red. In future most of our city residences are going to be constructed from brick of these pleasing colors. They give relief to the eye and variety. What can be more monstrous than a row of red brick houses? Washington is taking to the new style, and in this clear atmosphere, unspoiled by the soot from soft coal combustion, a house of this beautiful material will stand fresh for a century and be solid years after one made of granite had disintegrated.

Manufacture of Plumbago.

Graphite crushed and passed through a sieve of from 120 to 150 meshes per inch is stirred into a saturated solution of alum or aluminum sulphate at 212° F.; steatite is then added, and more water if required. After mixing, excess of water is evaporated until a consistency suited to grinding in a chilled steel or other mixer is obtained. More graphite may here be added; then, after thorough grinding, the material may be compressed into cakes for household use or is ready for the manufacture of pencils or crucibles. The average formula for the mixture is: Graphite, 80; steatite, soapstone, or talc, 14; alum, 6; but this varies with the purpose to which the material is to be applied. When several different kinds of graphite have to be employed, the richest in carbon is first mixed into the alum solution. By this process graphites previously regarded as incapable of being compacted are utilizable, and are improved in polishing power; for pencils, the material may be hard without being brittle, and black without being soft, while crucibles made from the treated graphite are at once harder, more durable and lighter.—Scientific American.

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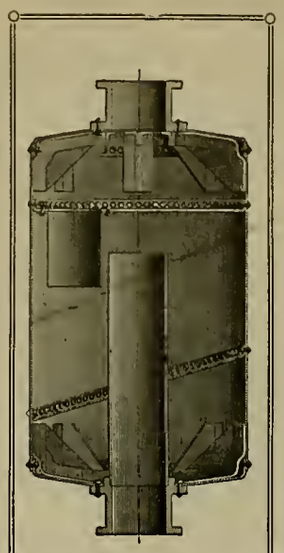

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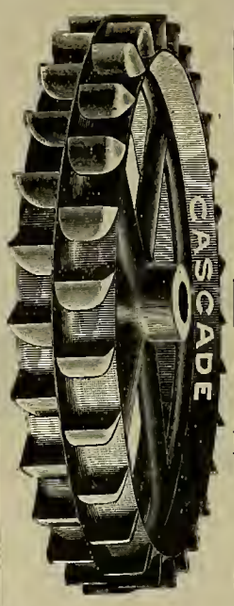

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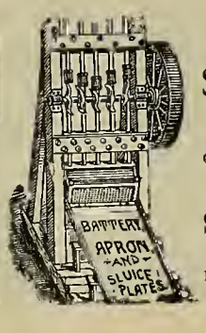

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Every description of work plated. Send for Circular

Market Reports.

The Markets.

New York Prices.

NEW YORK, Oct. 18.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29 5-6	63¾	....	....	....
Friday	29 1-16	63¾	9 25	3 15	19 25
Saturday	29 1-16	63¾	9 30	3 16	....
Monday	29 1-16	63⅝	....	....	....
Tuesday	29⅛	63½	9 40	3 18	19 10
Wednesday	29⅛	63⅝	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	15c
London Bankers' 60 days	$4.86
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63¾
Mexican Dollars, nominal	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	11
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIC TIN.			
Per lb	17	@	18
ZINC.			
Sheet	8½	@	9
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 7 75		
Greta	7 50		
Nanaimo	6 25		
Gilman	5 75		
Seattle	7 00		
Coos Bay	5 50		
Cannel	8 00		
Egg, hard	9 50		
Wallsend	7 00		
Scotch Splint	7 00		
Brymbo	7 50		
West Hartley	7 75		
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Splint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 18, 1894.

FIRST SESSION—9:30 A. M.

100 Alpha	13	450 G & C	65
100 Alta	24	100 Mexican	1 25
100 Andes	58	250 Ophir	2 70
200 Belcher	1 05	1000 Overman	23
350	1 00	100 Potosi	77
350 Best & Belcher	1 25	300	76
350 Bodie	1 25	250 Savage	62
100 Bullion	44	100 S B & M	17
400	43	100 Sierra Nevada	94
100 Challenge	50	300 S Hill	05
200 Chollar	67	100 Union	74
150 Con Cal & Va	4 75	100	73
100 Crown Point	76	100 Yellow Jacket	87
350 Exchequer	07	600	86

SECOND SESSION—2:30 P. M.

200 Alta	24	400 Gould & Curry	66
100 Andes	59	150 Hale & Norcross	87
350 Bodie	1 20	100 Justice	25
100 Belcher	1 05	300 Mexican	1 25
400 Bullion	45	300 Overman	23
10 Challenge	48	150 Ophir	2 75
200	52	150	2 70
200	51	100 Potosi	75
250 Crown Point	77	100 Silver Hill	04
100 Chollar	66	200 Savage	64
250 C. C. & Va	4 70	100 Sierra Nevada	92
100	4 75	100 Union	73
100 Exchequer	08	200 Yellow Jacket	86

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 9, 1894.

527,191.—CASKET HANDLE—L. H. Bannister, Pasadena, Cal.

527,188.—VOTING MACHINE—H. A. Clifford, S. F.

527,365.—BANDAGE MACHINE — W. N. Crabtree, Globe, Cal.

527,174.—SULKY HARROW — T. J. Hubbell, Santa Cruz, Cal.

527,335.—LINER AND MEASURE — S. Katani, Belmont, Cal.

527,150.—ELECTRIC AMALGAMATOR—J. C. Ludwig, S. F.

527,151.—SASH WEIGHT—H. Marshall, Los Angeles, Cal.

527,117.—VISE—H. C. Rasner, S. F.

527 157.—WINDMILL — Rigby & Reaves, Los Angeles, Cal.

527,085.—CARBURETOR—Sprague & Guthrie, Sacramento, Cal.

527,323.—CONCENTRATOR—A. C. Springer, Seattle, Wash.

527,132.—FUSE CAPPER — G. A. Teel, Newport Beach, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Mining Share Market.

SAN FRANCISCO, Oct. 18, 1894.

Sales of mining stocks have been rather heavy in Comstock securities during the past few days, but prices have declined. The report of Cons. California and Virginia is a very good one indeed, but the stock is selling at what a few years ago would have been considered a ridiculously low figure, taking into account the condition of the mine and bullion product. But it is difficult in these days to arouse much of an interest in mining stocks, and investors with much capital seem to be pretty well out of the business.

Although the Cons. California and Virginia Mining Company has the large surplus in actual coin of $165,500 in its treasury and a dividend of fifty cents per share could be declared and quite a reserve left after that, the directors have deferred the declaring of a dividend uutil the surplus is much larger. When the surplus reaches $250,000 or $300,000, the matter of a dividend will be definitely settled.

At the annual meeting of the Con. California and Virginia Mining Company, the following resolution was unanimously adopted by the stockholders assembled: *Resolved*, That the thanks of the shareholders of the Consolidated California and Virginia Mining Company he and are hereby tendered the managers of that mine for the efficient manner in wbicb its affairs are now handled. That the hullion returns from ore crushed show that the management is handling the property for the best interests of shareholders. This is proven by the following returns: During September 1586 tons of ore, valued according to railroad car samples at $57.89 per ton, or a gross valuation of $91,813.54. The mill returned in hullion $52.87 per ton, or $83,879.60. The bullion returned is 91.23 per cent of the railroad car sample. The railroad car sample per ton of the ore crushed was $57.89 per ton. The battery sample average per ton was $59.24. The bullion return per ton was $52.87.

The following illustrates the changes of the week:

MINES.	11	18
Alpha	$ 12	$ 13
Alta Consolidated	15	24
Andes	58	59
Belcher	75	1 05
Best & Belcher	1 35	1 25
Bodie	1 25	1 25
Bullion	36	45
Challenge	53	52
Chollar	65	67
Confidence	1 15	....
Consolidated California and Virginia	4 90	4 75
Consolidated New York	....	....
Crown Point	80	77
Exchequer	....	08
Gould & Curry	74	66
Hale & Norcross	90	87
Justice	22	25
Mexican	1 30	1 25
Ophir	2 90	2 75
Overman	23	23
Potosi	81	77
Savage	69	64
Sierra Nevada	1 00	94
Union	81	74
Utah	8	....
Yellow Jacket	84	87

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ORE CONCENTRATOR.—Luther Look, Soldier, Idaho. No. 526,242. Dated Sept. 18, 1894. This is a percussion or bumping table. It has at one end a circular swinging motion, combined with a side bump, and at the other end a reciprocating end shake or motion. The table is a freely swinging triangular one having suspension devices with a pivoted longitudinally sliding connection at its head. At one side of the foot of the table is a horizontally turning notched cam having a strap in which it works. At the other side is a bumper and a spring, and between the spring and cam the table, or that end of it, is moved sidewise against the bumper, while the other end turns about and slides upon its pivotal connection. The peculiar motion at the head provides for an effective feed of the pulverized ore, thereby increasing the capacity of the machine and improving the quality of the result. The swinging motion and bump at the other end of the table produce an effective settling action similar to that of a gold pan. The mineral is drawu to one side as fast as it is settled, and the whole operation is a continuous and automatic discharge of the different classes of concentrates and the tailings.

CAR COUPLING.—Warren F. Drew, Sacramento, Cal. No. 526,303. Dated Sept. 18, 1894. This coupler is one of the hook class, and by reason of its construction can be made small and yet with sufficient strength and durability. It can be uncoupled from the top or side of the car and used in connection with the link and pin of the old styles when required. The coupling consists generally of a drawhead to receive a draw bar, swinging levers within the drawhead chamber having hooks adapted to engage the draw bar, a spring-controlled sliding rod in the back of the drawhead chamber, links connecting the rod with the rear ends of the hook levers whereby the latter are controlled, and connections for operating the sliding rod.

BOILER-FURNACE.—James Grogan of Prescott, Arizona. No. 526,485. Dated Sept. 25, 1894. This furnace consists of a shell having a boiler supported within it, and having a fire-box, the sides and back of which slope inwardly and downwardly for a short distance. The shell has also a closed chamber in the lower portion back of the fire-box, in which chamber is a tortuous passage formed by vertical partitions extending inwardly from each side and each terminating short of the opposite side. Into this tortuous passage air is admitted, and being heated therein is discharged into the space below the grate bars, to increase the draft.

TEA CHEST AND ATTACHMENT.—Cornelius Toohey, San Francisco. No. 526,511. Dated Sept. 25, 1894. The object of this invention is to provide a chest or package for the transportation of tea, coffee or other aromatic or delicate substances which it is necessary to seal hermetically during transportation; a means for transferring said package into a caddy, and a containing caddy with an attachment by which the contents are replaced to be removed from time to time at will It consists of an exterior wooden box having an opening upon one side near the bottom, a sliding movable door fitted thereiu to complete the side of the box, an interior impervious bag fitting witbin the box, a frame and shield fitting within the bottom of the bag, having an opening beneath the shield which coincides with the opening in the side of the box, whereby communication is made with the interior of the package by removing the sliding door and cutting away the lining bag in lines coincident with the opening in the box. In conjunction with this is a segmental casing having an opening made through the segmental front, and a corresponding opening through the vertical rear side, a segmental door pivoted to rotate within the casing to open or close the same, and tongues and grooves fitting corrospouding edges in the opening of the box, whereby it may be easily fitted thereto when the removable door has been taken away.

BED-CLOTHES CLAMP.—Henry L. Jessen, Watsonville, Cal. No. 526,490. Dated Sept. 25, 1894. The object of this invention is to provide a means for retaining bed clothes in their proper position during the night, so that children or restless people will not be able to disarrange them and throw them off. It consists of opposing plates, the forward ends of which are adapted to grip the bed clothes, one of the plates having its rear end upturned and a fulcrum upon the opposing plate, the other plate being extended beyond the fulcrum point and provided with a means for detachably engaging a holding loop and a means engaging both plates and interposed between the fulcrum point of the plates and the jaws thereof for adjusting the jaws and clamping the bed clothes between them.

WRENCH OR CLAMP ADJUSTER.—William J. Wright, Oakland, Cal. No. 526,476. Dated Sept. 25, 1894. This invention relates to improvements in wrenches of that class known as "monkey wrench," and similar clamping devices. The object is to provide a means for minutely adjusting the jaws and permanently locking them in position after adjustment. It consists of a bar or shank sliding in a guide or casing, independent separable plates fitted to the shank, and a trausversely movable locking plate fitted to the casing and adapted to pass between any pair of plates or be disengaged therefrom, said locking plate or bolt being provided with a combined operating arm and spring catch adapted to engage a recess or shoulder of the guide or casing and lock the locking plate or bolt in engagement with the said plates.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12, Oct 17, Nov 7	J E Jacobus, 309 Montgomery
Bay State M & D Co, Cal	22	2c	Aug 25, Sept 20, Oct 24	F E Luty, 330 Pine
Belcher M Co, Nev	49	25c	Sept 14, Oct 18, Nov 8	C L Perkins
Golden Eagle M Co, Nev	1	15c	Sept 15, Oct 16, Nov 5	E B Holmes, 309 Montgomery
Ideal Placer M, W & P Co, Cal	1	10c	Sept 11, Oct 22, Nov 12	E L Mayer, Mills Building
Lady Washing'n Con M Co, Nev	10	5c	Oct 5, ... Nov 9	J E Jacobus, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3, Nov 8, Dec 3	J W Pew, 310 Pine
North Banner Con T Co, Nev	32	3c	Oct 6, Nov 6, Nov 27	C E Green, Fourth and Townsend
Ophir S M Co, Nev	63	25c	Sept 5, Oct 9, Oct 29	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	12	30c	Sept 4, Oct 15, Nov 12	J W Pew, 310 Pine
South Eureka M Co, Cal	14	1c	Sept 20, ... Oct 29	A Halsey, 320 Montgomery
Utah Con M Co, Nev	20	5c	Sept 28, Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3	....	Sept 27, ... Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Teresa M Co, Cal	K J Willats, 809 Market	Oct 19

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The dictionary gives evidence of a large amount of painstaking work on the part of the author, and possesses features which must be commended. Among these, the author, wherever occasion required it, has furnished the synonyms of terms, and the book is given an additional value by an alphabetical index, which enables it to be consulted for terms both collectively and individually. The work will prove of value to the reader, whether professional or non-professional. The definitions are put tersely and concisely, so that the inquiring reader can carry away a defined, net impression as to what is meant. Any student who will spend his leisure hours over the volume will be amply repaid for his time and trouble. The book is very clearly printed in bold type on good paper, and is well bound.—*N. Y. Electrical Engineer*

Sent Postpaid on Receipt of Price.

MINING AND SCIENTIFIC PRESS,

220 Market St., San Francisco, Cal.

Coast Industrial Notes.

—The Sonora flour mill has been leased by K. A. Steinhauser and Wm. Kruger.

—In the Mayflower mine, Amador City, a lot of good paying ore has been encountered and is being milled. The Mayflower has ordered a roller mill.

—The Southern Pacific Company has, since the recent railroad strike, reduced its clerical force by 400 persons. The company employs, in all departments, about 25,000 people.

—The Bear Valley Irrigation Works, the largest in southern California, have been purchased from the receivers on behalf of the larger creditors, who will invest further considerable sums in necessary developments.

—Interest in the recent new oil discoveries at Los Angeles is unabated. A multitude of wells are sinking, and the results in almost every case are satisfactory. Los Angeles is in a fair way to solve the problem of cheap fuel.

—The foundry at Sonora, Tuolumne county, is now casting the iron work for a ten-stamp mill for the Ham and Birney mine; revising and reconstructing an engine for the Dutch quartz mine at Quartz mountain, and doing large repairing for the Black Oak mine at Soulsbyville.

—Truckee is to have another extensive ice-storing works. A new pond is being constructed on the Marzen meadows, between Truckee and Donner Lake. It will cover an area of thirty acres. An ice-house 100 feet by 300 feet will be erected, and a crop of ice will be harvested this winter.

—Superintendent Hale of the Keystone mine, Amador county, is having a new floor put in the mill. Twenty stamps were hung up two weeks ago to make repairs, and at the same time new mortar blocks and mortars are to be put in. They recently made a great strike of a magnificent body of ore, which is more than pleasing to the superintendent and stockholders.

—The shipments of freight from California east, during the month of August, as shown by a report recently tabulated by the Southern Pacific Company, aggregated 83,207 short tons. This is the largest total for any one month in the history of the State. The shipments for August, 1893, aggregated a fraction over 50,000 tons, which total was over 4000 in excess of that for the corresponding month of the preceding year.

—The Reno (Nev.) Water, Land and Light Company is busy preparing for the winter and making a number of changes and improvements. M. J. Curtis and a crew of men are now working on one of the new flumes which will shorten the ditch over half a mile, and another one is to be built. As soon as this is completed, work will be pushed on the new electric light station, and before snow flies the company hopes to have one of the best, if not the best, systems of water and light supply on the coast.

—From Allen Mead, the Plumas *National-Bulletin* learns that at Moonlight, in Cook's canyon, about six miles above the ranch of J. F. Evans, is a large deposit of iron ore of very high grade, probably containing seventy-five per cent in mineral. Mr. Mead says it forms part of a great mountain, and would furnish a supply practically inexhaustible. Some day this deposit of iron will become a valuable property. Of course, transportation facilities are needed, as well as a supply of coal. The timber supply, however, is nearly unlimited. In that vicinity there are also deposits of native copper which have attracted much attention.

—Tunnel No. 1 of the Arrowhead Reservoir Co., San Bernardino county, is through. The total length of the tunnel as made by the opening is 4900 feet, making connections with Little Bear valley reservoir and Grass valley, where the second reservoir is to be established. The tunnel is 6x8 feet in size of opening, somewhat enlarged in places where soft rock was torn away by the blasting. There is but little timbering in the tunnel, as it is through rock all the way. Work was originally begun at both ends of the tunnel, but by the flow of water entering the upper end the workmen were driven out, and, after two years of hard labor, some of the time but two feet a day being made, the tunnel is now open. It is expected that two years more will be consumed in completing the work. Tunnel No. 1 is the largest of the series of tunnels to be constructed in order to get the water into this valley. Tunnel No. 2, from Grass valley to Huston flat, 2000 feet long, was completed some time ago. The third longest is 1700 feet in length, and the shortest 300 feet. Work upon the dam will be begun at once. This is to be made of very massive and firm masonry, in order that it may be made higher if it should ever become necessary or be thought desirable. The work now is to construct a dam 125 feet tall, and about 700 feet across at the top. This will make a basin about three miles in length and 125 feet deep at the deepest place. It is a big undertaking, but is getting on at a most satisfactory rate.

—That the ice industry is an important and growing one is evidenced by the erection of new ice-houses and the construction of new reservoirs every year. It is one of the principal industries on the Truckee river, where there is every natural facility for it. Let the State go into the business, as has been recommended by Governor Markham, of making artificial ice with convict labor and the business of storing natural ice will be killed. Hundreds of men who depend upon the wages received from that source for a part of their year's living will be thrown upon the country and made paupers of for a portion of the year. We fail to see where the State would be benefited by such a move, and we think that better judgment will prevail. Men who have invested their money in that industry have a right to consideration.—Nevada City Herald.

—There is considerable work being done on Donner creek, about one and one-half miles from Truckee, says the *Republican*. Joseph Marzen has about twenty men at work constructing an ice pond. Although the men have only been at work about two weeks, they have made quite a showing. A very substantial dam is being made. Some of the timbers used in constructing it are eighty feet long and forty inches at butt, and are fastened down by long inch drift bolts. The space between the timbers will be filled in with rock and the face of the dam will be of heavy lumber nailed down to the timbers. It is thirty-six feet long at the base, while on the top it is one hundred and fifty feet long and sixteen feet wide. This ought to hold quite a force of water. The dam will be twelve feet deep and will cover an area of thirty acres, while at the upper end it will be four feet deep. It is expected in the near future to make it twenty feet high and then it will cover an area of 160 acres.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

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SAN FRANCISCO, SATURDAY, OCTOBER 27, 1894.

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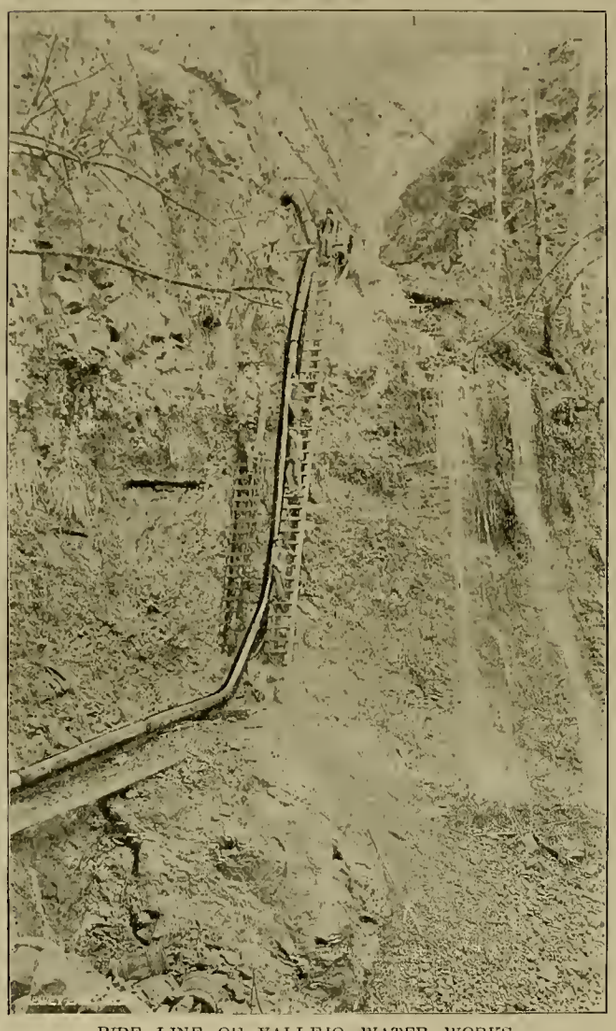
Riveted Sheet Iron Pipe Line.

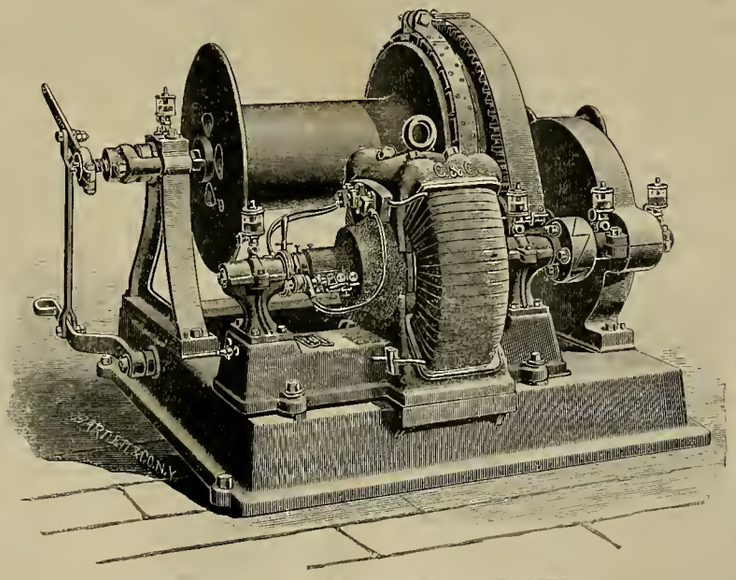
While the accompanying illustration presents a picturesque bit of scenery not uncommon among the mountains adjacent to the Bay of San Francisco, it also affords a glimpse of the pipe line which conducts water to the service reservoir of the Vallejo water works. The photograph was made near the head of the line and a little below the supply reservoir, which is some sixteen miles distant from Vallejo, on the Falls branch of the Green valley creek, at an altitude of about 1200 feet. At the point shown in the illustration the pipe is carried up the face of a cliff seventy-five feet in height. To prevent its injury by falliug rocks or trees, it was laid in a trench excavated in the solid rock and (since the picture was made) covered with cement. The length of the pipe is fourteen and one-half miles, four miles of which is twelve-inch, followed by three miles of ten-inch, in diameter, riveted sheet iron pipe, manufactured by the well-known firm of W. W. Montague & Co. of this city. The balance of the distance it is ten and eight-inch Congress lock joint. As may be inferred from the engraving, the character of the country is rough. The pipe traverses in its course a tunnel 1900 feet in length, and at points the pressure is very great, there being an inclination in some places of 78°. The pipe was put together on the ground, being conveyed thereto in sections of twenty-six feet, and is coated with a special preparation that insures its lasting quality. As a test, when complete, water was let into the pipe and held under pressure two weeks, no leakage occurring at any point, a fact which reflects much credit upon the manufacturers, while also showiug the thoroughness with which the engineering work was done. The capacity of the supply reservoir is some 350,000,000 gallous and the capacity of the pipe line 1,000,000 gallons per day, the purpose being to furnish a water supply for Vallejo and Mare Island, with a population of 7000. The cost of the plant was $280,000, including all works, right of way, etc., which was met by an issue of bonds ruuniug twenty years. Work beguu in May, 1893, and completed in July, 1894, being conducted by the eminent civil engineers of this city. Hubert Vischer and C. E. Grunsky.



PIPE LINE OF VALLEJO WATER WORKS.

A CONTRACT has been made between the Tacoma Smelter Company and the Bunker Hill and Sullivan Mining and Concentrating Company of Wardner, Idaho, by which 800 tons of ore monthly, for six months, will be shipped from Wardner to Tacoma for smelting. The ore carries sixty-five per cent of lead and thirty ounces of silver to the ton. Part of it will be sent to the Selby smelter.

THE Hidden Treasure Mining Company, Placer county, is extending the Dam tunnel, building shops, etc., and making all preparations for active operations through their uew property.



ELECTRIC HOIST FOR MINING PURPOSES.

Electric Hoists and Pumps for Mines.

Where so many of the improvements in electrical machinery are directly in the line of mining interests, power transmission, hoisting works, pumping plants, etc., it may be timely to give a brief description of some of the products of the well known electric machinery manufacturers, the C. & C. Electric Co. of Garwood, New Jersey. The company has always been run upon conservative lines, so that no work is turned out that is not thoroughly up to the standard. Their dynamos and motors are unique in structure, and being compact and efficient they are especially adapted to mining work. The field magnet is of a circular form, consisting of two segment shaped cores solidly bolted to heavy cast iron pole pieces, the bottom pole piece being made of one casting with the bed. The cores are of the best steel casting, with flanges at the end for holding the coils in place. The use of steel castings for the field cores was decided upon after exhaustive tests by the C. & C. Electric Co., and has proved of great advantage. The center of the circle encircling the field magnet coincides with the center of the armature shaft, thereby making a most compact symmetrical and solid machine.

The field coils are wound directly on the cores by hand, and, the wire being under continual inspection during the winding, defective insulatiou is impossible.

The armature is of the drum form, built up of sheet iron dises prepared by a special process to prevent heating from the Foucault currents. These dises are compressed in a powerful hydraulic press and held together by longitudinal bolts passing through the plates which are keyed to the shaft. The bearings, commutator, brush holders and all the parts are made after the latest and most improved methods.

The above is a brief description of the bipolar dynamos aud motors for ordinary work. The design of the machine is the same when used with pumping apparatus, hoist or ventilating machinery. The motors are made in combination with pumps of various sizes, ranging from 1½ to 12 inches cylinder, and having a capacity of from 200 to 900 gallons per minute at a pressure of sixty pounds. The C. & C. pumping combinations are in use in many large plants all over the couutry, notable among which is that of the city of San Autonio, Texas, which has been in operation since February, 1893, giving perfect satisfaction. The plant consists of three triplex Gould pumps geared directly to three C. & C. standard motors of thirty H. P. each. The total capacity of the station is 2,250,000 gallons per day.

In connection with hoisting machinery, the C. & C. motor has also obtained an enviable reputatiou. The hoists are built to withstand the rough usage that such machines are liable to, being simple and compact in construction.

(*Continued on page 261.*)

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San Francisco, October 27, 1894.

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The Miners and the Laws.

The priucipal topics of discussion before the State Miners' Couvention next month will doubtless be: The Newlands bill; The unjust department ruliugs with relation to mineral lauds; Improvement on methods of obtaining title to mineral lands; aud, Government aid to the rehabilitation of hydraulic mining. All of these are of the greatest importance to the mining industry and need intelligent discussiou and conclusion before being called to the attention of Congress, the only body which can afford a remedy.

It is, however, highly probable that radical chauges may be made, not only iu the laws themselves, but in the department rulings under these laws, provided the miners properly formulate their statemeuts for presentation to the congressional committees. But the miners must work together in the commou cause to accomplish any good results. The annual convention of the Califoruia Miners' Association affords a fittiug opportunity for discussing these subjects and for petitioning Congress for relief from the existing evils.

The Stewart mining bill, which persistently appears at each session, but thus far has fortunately not become a law, is by uo means what is wanted. It limits the amount of mining ground which can be taken up and patented under one patent to so small an area that the drift miuing iudustry of this State—a very important branch of gold mining—would be greatly hampered. This has been repeatedly poiuted out to Senator Stewart aud the reasons given, but he still persists iu retaiuing the objectionable clauses in his bill, notwithstanding the earnest protests of the miners of this State.

The Newlauds bill, which was drafted by a committee of the State Miners' Association, aud introduced at the request of that body, is designed as a substitute for the Stewart bill, and therefore needs the earnest advocacy of the mining community. It is drawn in the interest of both quartz and drift miners.

As far as the unjust rulings of the Land Department are coucerned, their evil effects on the mining industry have been repeatedly pointed out in these columns. It will take the united efforts of the miners of the country to make any impression iu this direction, as the departments are bound up in precedent and red-tape so tightly that it is doubtful if they can take the proper view of things even if so disposed.

But their precedents should be upset and their red-tape cut so as to free the mining iudustry from the unnecessary burdens under which it is at present laboring. This can be accomplished by keeping at it loug enough and persistently enough. Ordinary remonstrance has gone on for years, and it is time now for vigorous united efforts to remedy the evil.

As to the present system of obtaining title to mineral lands, it is cumbersome, expensive, slow, tedious and vexatious. The miner has to pay twice as much for his ground as the agriculturist, and wait about six times as long before he can get his title. The general plan and the details are all of the Circumlocution Office type and apparently designed to prevent men getting title rather than to aid them. The whole system wauts chaugiug.

As to Government aid toward the construction of dams in the rivers to restrain mining debris, that is a topic which will take serious consideration. The hydraulic miuers made a hard fight for recognition and finally obtained it, and it may be that they will be able to accomplish something further.

Our Auriferous Beach Sands.

While in other parts of the world, notably in Australia, they have made a success in continuously working deposits of beach sands, it is on this coast an intermittent industry, and not a very profitable one at that. On the coast of the northern part of California and southern Oregon are the most extensive deposits, and quite recently there has been renewed interest in their development. Some companies are just now beginning to work the Oregon beaches on a larger scale than formerly. Up in Alaska beaches are worked every year aud yield some profit. In the southern part of California, at the beach near Lompoc, a few years ago there were a hundred or two men at work, but last year the claims were not operated.

The gold found on these beaches is exceedingly fine and flaky and difficult to save by the ordinary methods of gold washing. The heavy black magnetic sauds are almost of the same specific gravity as this flaky, thin gold, so there is much loss in the ordinary sluice. But the main practical difficulty seems to be that there is less gold per ton in the sand than is generally supposed. Occasional spots may be found where the sand will run $15 or $20 per ton, but these are scarce, and generally found after storms when the ocean waves have concentrated the gold on the beach.

The general run of the beach sand is more nearly $1.50 to $3 per ton. Takiug it as it comes, it will hardly reach the figure of $6.82, as stated by Mr. Paul in his article in the PRESS of the 13th inst. A new beach, hitherto unmined, or one which has been unworked for some years, may reach such a figure, but most of the beaches where the sand is fouud have been more or less worked during the past forty years. There are known deposits, it is true, which have been hardly touched. That at the big lagoon on our northern coast is quite extensive, but has paid very little of late.

A great many plans have beeu suggested aud tried to make this beach sand industry profitable on a large scale, but none have been unqualifiedly successful. Only two years ago the Portland amalgamator, which had been successful on the fine Snake river gold, was taken to a large deposit of black saud back from the beach of Monterey bay. With this was used a magnetic separator, arranged to handle 1000 tons of sand per day and to set aside 700 tons of magnetic iron saud, leaving the gold in the light sand, which was then to be worked by the amalgamator. The trouble with this plan was, the gold was to pay expenses, and the profit to come from the sale of the magnetic iron. But this could not be sold here. There was no market for it whatever, and there was nothing in shipping it. The enterprise was therefore not a success.

A new plan of treating these sands is suggested by Mr. E. W. Keeler in a letter in auother column. We do not understand from what he says that it has stood the test of experience in any large scale. It must be remembered that with these sands, as with any other low-grade material, too much handling will not do, nor will two or three operations in the treatment pay. The sands, being heavy, pack very closely in whatever vessels they are treated and cannot be massed in large quantities at ouce. Mr. Keeler does not describe the "contrivance" which he uses submerged in the tank, so it is impossible to judge much about the details of his plan.

Aid from Other Mining States.

As the miners of California, at their anuual conventiou in this city next month, intend discussing the United States mining laws, with a view to obtaining some relief from Congress, it might be well for them to invite co-operation from other mining States. At their first and second State conventions they were principally engaged in an attempt to rehabilitate hydraulic miniug in Califoruia, in which miners in other States were very little interested. Special congressional laws having been adopted to that end, attention is now to be turned to the laws affecting quartz and drift mining interests. Those relating to quartz interest miners in all sections of the country, and they should all be asked to assist.

There seems to be no reasou why the Executive Committee of the State Miners' Association should not iuvite the Governors of Nevada, Oregon, Montana, Idaho, Washington, Utah, Colorado, Dakota, Arizona and New Mexico to send delegates to this convention to aid in a work which will benefit the miners generally. The questions involved affect the Western regious almost entirely. The miuers of California should not attempt single-handed to institute reforms in laws which interest so many in other States. Unity of action is necessary to accomplish anything in this direction, and no doubt the other States would "stand in" if invited.

By confining their efforts to one or two subjects, and laying the case properly before Congress, some attention will be paid to the demands, especially if they are reasonable, as they will be. It is as well to understand, however, that it would serve little purpose to turn the convention into a "silver congress," by taking up much time with that subject. There have been numerous silver congresses, and floods of memorials and resolutions from assembled miners; but silver having finally got into politics, its complaints and demands do not seem to be paid much more attention to by Congress than those of politicians themselves. A strong free-silver resolution would be fitting and proper at this convention, the delegates all being miners, but that subject might be left to the special congresses which discuss it, and most of the time be taken up iu arranging for a revision of the general mining laws.

As is pointed out in another article in these columns, there is plenty of work before the coming California Miners' Convention. It is expected to deal mainly with proposed mining legislation and rulings of the Departments. Judicious action in these directions will make itself felt, and it is the duty of all miners to give these subjects their best considerations. The Governors of other States should send delegates, who would aid the California miners by their experience and advice, and on their return to their homes they could urge the assistance of their Representatives in Congress to the measures endorsed by the convention. There is time to invite this co-operation, provided the executive committee of the California Miners' Association approves the suggestion.

A Large Gas Engine.

The development of the gas engine for both marine aud stationary work is being rapidly carried out. Already there are numbers of them in use for hoisting, etc., at mines, but their principal use has been in marine work. Starting only a few years ago in this city to serve as substitutes for the naphtha engines on launches, larger sizes have been gradually introduced until they are now being used for business as well as pleasure on the water. The largest one yet built by the Union Gas Engine Co. was tried last week on the new schooner Moro. It is of seventy-five-horse power and propelled the schooner on her trial trip nine miles per hour. This is a very good record indeed, and will doubtless lead to the construction of other engines of this type for good sized schooners.

The gas is formed from gasoline, and is exploded in the cylinders by an electric spark. Of course the boiler is doue away with, there being no steam, so

that the whole motive power takes up very little room, which is an important factor in vessels. The Moro is quite a handsome vessel, and was built at the shipyards at Oakland. She is to ply between this city and the Albion river, on the north coast.

Rafting Lumber at Sea.

Another failure in rafting lumber on a large scale from the northwest coast is to be recorded. This one was built at Stella, Wash., but went to pieces while being towed to this port. This raft was cigar-shaped and contained 10,000 logs, or about 8,000,000 feet of lumber, worth $50,000 up there, and three or four times as much here. It was 540 feet long, 54 feet beam, 26 feet deep and 21 feet draught. The piles or logs averaged 50 feet in length and 14 inches diameter at the center, though there were some spars 100 feet long and 30 inches in diameter. The raft was built solid and secured by about sixty tons of strong chain. There was enough lumber to make cargoes for about ten vessels.

Soon after leaving Astoria the tug met a succession of gales and rough seas, and the raft began to go to pieces; when abandoned there was only about seventy-five feet of it left.

The attempt to tow these big rafts on this coast has not been a success, several having been wrecked. A number of trials have been made. The Pacific is by no means true to its name in these latitudes, for, even if there are no heavy winds on the immediate coast, off-shore gales are apt to create a heavy sea. There are no harbors to put into, and once started the raft must take what it meets in the way of weather.

The sailors on the coast are very much opposed to these attempts to raft lumber, claiming that when the rafts break up at sea, as they generally do, the thousands of floating piles are menaces to navigation. If there is exceptionally calm weather a raft may be brought down from the lumber ports, but rough weather along the coast is more frequent than calm, as experience proves. The recent heavy loss of lumber will doubtless prevent another trial in ocean rafting of lumber for some time.

The Mining Bureau Museum.

Among the the recent contributions to the museum of the California State Mining Bureau are the following:

Gold quartz rich in free gold from the Bonanza mine, Lundy, Mono Co., from J. Parrett; barite, good quality, Mineral Hill, Mono Co.; rhodocrosite, very fine specimen, from John Reed mine, Colorado.

Tin ore showing abundant crystals of cassiterite, Cotogoita, Bolivia, from J. J. Hill.

Five slabs very handsome marble from Ensenada, Lower California, from Antoine Fusillet.

Iodyrite (iodide of silver), embolite, stalactite, limonite, auriferous basalt, cerrussite, stolzite, pyromorphite, and a number of other specimens of interest from Australia.

Auriferous conglomerate specimens from five or six mines at Johannesburg, South Africa, presented by Alexander M. Womble.

Telluride ore, Good Hope mine, Colorado, from Ira A. Scott.

Native copper with gold and silver, Mountain Meadows, Plumas Co., from Wm. C. Root.

Coal, said to be the best found in Mendocino Co., from a six-foot vein known as the Thomas mine, Eden valley, also copper ore of good quality from same locality; both from Mr. W. P. Thomas.

Fluorite, Ferris canyon, Sweetwater Mts., Nevada, near California State line.

Cassiterite (crystals) from Perak and Selampore, Malay Peninsula, between Penang and Singapore, from Dr. Jno. Rabe.

Auriferous conglomerate and calcite containing cinnabar from Golden Fleece mine, Ashland, Oregon; found in the "Chico" cretaceous sandstone, and supposed to be a continuation of the auriferous gravel recently found in Siskiyou Co., Cal.

Zinc ore, Santiago canyon, Orange Co., Cal.; and a large number of specimens of gold quartz, ores, minerals, rocks, etc., of interest from various localities in California.

There has been placed on exhibition by Mr. Alexander M. Womble a remarkable specimen from South Africa—antimony ore with free gold and fourteen small diamonds!

THE Virginia *Chronicle* says: The bullion yield from the recent discovery of ore in the Con. Virginia mine is beginning to make itself felt in a number of ways. Superintendent Lyman filed a sworn statement of the bullion yield for the last quarter ending September 30th, with Sheriff and ex-officio Assessor Quirk. The statement shows that the county of Storey is entitled to a bullion tax for the past quarter of $5572.10. The gross bullion yield of the Con. Virginia for July, August and September, according to the statement, was $204,590.29. The total cost of extraction, transportation and reduction was $93,149.16. The net bullion yield was $111,441.13. The tax on the net yield at $5 a hundred comes to the figure named. Prior to the quarter just ended there was no net yield of bullion for a long period; hence there was no tax to be collected. The Con. Virginia Company has a certain time, fixed by law, in which to pay the tax for the quarter just completed. This revenue, although not large, will be a welcome addition to the slim assets of Storey county. It is to be hoped that the grand old mine that yielded it will keep coming in the same fashion for a long time.

Railroad Selections of Mineral Lands.

Miners who have only possessory title to their mining claims, and no patent, should at once look up their exact location and see that their rights are protected, or, under a recent ruling of the Interior Department, they may find they have lost their property. Even those who have, by location and regular annual assessment, held their claims for years, supposing their title good, now have their rights endangered, and, unless they take care, they will lose their claims.

A recent decision of the U. S. Supreme Court in the case of Bardon vs. the Northern Pacific Railroad Co. holds that the Secretary of the Interior may determine the character of railroad land up to the time of issuing patent to the railroad company, but that after such patent has issued, the land is without his jurisdiction and no further hearing to determine the character of the land can be had.

Pursuant to this decision the Secretary of the Interior, on the ninth day of July, issued a general circular having reference to selections by railroad companies of lands located within supposed mineral regions. By this circular it was provided that wherever a list of railroad selections covered lands located within six miles of any mineral entry, claim or location, a publication should be made for sixty days, calling upon such mineral claimant to appear and protest against the railroad selections, and in the *absence of such protest*, the land should be adjudged to be agricultural in character and the list would be approved and patents issued accordingly to the railroad company.

Herein lies the danger to those claim owners whose claims are within the regions affected by the railroad interests. Unless they notice the advertisement, and make an effective protest, their mineral ground is apt to be turned into agricultural by due process of law.

It is a well established principle of law that upon findings of fact the decisions of the Secretary of the Interior are final and will not be reviewed by the courts. Inasmuch as very few mineral claimants know either of the Borden decision or the circular instructions by the Department, they are very apt to overlook or ignore the publication of the list of railroad selections; and inasmuch as their interests are so vitally affected by the proposed action, it is highly important that the greatest publicity should be given the matter to the end that the mineral claimants appear before the local Land Office and perfect their claims. Of course it is best to get a patent and settle the legal right to the ground for all time. It is not right for the Government to be deprived of the price of the claims, and it now is seen that it does not propose to allow the matter to continue indefinitely. In other words, this is practically an effort to compel miners to perfect their title by applying for patent.

In conversation this week with Mr. A. H. Ricketts, the mining lawyer of this city, who wrote the article in the last Report of the State Mineralogist entitled "A Dissertation upon the Origin, Development and Establishment of American Mining Law," some of the above facts were elicited, and he expressed the belief that this is but one of the ways in which these imperfect (because unpatented) mineral claims are liable to be attacked in the near future, and that too much importance cannot be given to the idea that all mineral claimants should perfect their title at an early date. Furthermore, a source of danger to the mineral claimant which should not be overlooked in this connection lies in the form of the notice to be given of the railroad company's application for patent.

The instructions simply provide that the lands sought to be patented shall be designated by legal subdivisions without naming the adverse claimants therein, and such claimants may derive no information from a notice that certain lands so described embracing their mineral locations, for it is seldom that the miners know or give thought to where the township lines are. And so, resting in the fancied security of their possessory title, they give no heed to such notices nor discover the *locus* of such lines until after their mining claims are covered by an agricultural patent.

By the courtesy of Mr. Ricketts we are enabled to publish the full circular of instructions of the Secretary of the Interior. It is as follows:

DEPARTMENT OF THE INTERIOR,
WASHINGTON, July 9, 1894.

The Commissioner of the General Land Office.—SIR: In the matter of the selection by railroad companies of lands in satisfaction of their grants, the following rules and regulations will be observed in determining whether the lands selected are mineral or non-mineral lands:

1. When the lands have been returned by the Surveyor-General as mineral, a hearing may be had to determine the character of the land.

2. Where the lands selected by the company are within a mineral belt or proximate to any mining claim, the railway company will be required to file with the local land office an affidavit by the land agent of the company, which affidavit shall be attached to said list when returned, setting forth, in substance, that he has caused the lands mentioned to be carefully examined by the agents and employes of the company as to their mineral or agricultural character, and that, to the best of his knowledge and belief, none of the lands returned in said list are mineral lands.

Upon receipt of said list, you will cause it to be examined and a clear list to be prepared of all lands embraced therein that are not within a radius of six miles from any mineral entry, claim or location, which list shall be transmitted to the department for its approval. If any of the lands embraced on said list of selections are found upon examination to be within a radius of six miles from any entry, claim or location, you will cause a supplemental list of such lands to be prepared and return the same to the Register and Receiver in the district in which they are situated, and notify the railroad company that they have been so returned. The Register and Receiver will at once cause notice to be published in such newspapers as shall be designated by the Commissioner of the General Land Office, containing a statement that the railroad company has applied for a patent for the lands, designating the same by townships, and has filed lists of the same in the local land office; that said lists are open to the public for inspection, and that the local land offices will receive protests or contests within the next sixty days for any of said tracts or subdivisions of land claimed to be more valuable for mineral than for agricultural purposes.

At the expiration of said sixty days the Register and Receiver will return to the Commissioner of the General Land Office said supplemental list, noting therein any protests or contests or suggestions as to the mineral character of any of such lands, together with any information that may have been received as to the mineral character of any of the lands mentioned in said list. After the same shall have been returned by the Register and Receiver, you will first eliminate from said supplemental list all the lands that have been protested or contested or claimed to be more valuable for mineral than for agricultural purposes concerning which any suggestion has been made as to the mineral character. The remaining lands you will certify to this department for approval and patent as agricultural.

In regard to lands protested or contested, or claimed to be mineral, or concerning which any suggestion has been made, or report by the Register and Receiver as to their mineral character, you will order a hearing to be had by the local land officers in each case, after giving due notice to the persons furnishing such information and to the railroad company under the said rules and regulations of this department concerning hearings in cases where the land has been returned as mineral land.

The railroad company shall pay to the Register and Receiver the cost of advertising said lands in the manner set forth.

You are further instructed that all lists which have been heretofore prepared in accordance with any rule, regulation or instruction of the Secretary of the Interior, where such rules have been complied with (such as furnishing affidavits showing the non-mineral character of the lands in accordance with the instructions of the Interior Department) and such mineral affidavits furnished for each subdivision of forty acres shall be excepted from the terms of the foregoing regulations; also, where lists of selections are now pending of lands returned by the Surveyor-General as mineral, where hearings have been in accordance with Rules 110 and 111 of December 10, 1891, and the local officers have determined that said lands are non-mineral in character, and such determination has been approved by the General Land Office, such lands shall be submitted to the department for approval without further investigating, although they may be within six miles of any mineral claim or location, unless, since said hearing, mineral claims or locations have been made of any tract embraced in said list, in which event you will eliminate said tract from said list and hold the same for future investigation. Very respectfully,

HOKE SMITH, Secretary.

Miners should give immediate attention to the conditions herein described and be prepared to take the necessary steps to prevent losing their claims by neglect of the proper precautions. They should at once find the exact location of their claims with reference to legal subdivisions, and look out for the advertisements of the railroad company when they apply for their patents. But the better way is, of course, to perfect title by obtaining a title by patent from the Government as soon as possible.

Personal.

WHILE Mr. Ross E. Browne was away on his recent trip he examined some large hydraulic mining properties in British Columbia.

F. B. HOBBS of Boston, Mass., has arrived in Downieville, Sierra county, to set up and run the electric plant of the Gold Bluff mine.

MR. THOS. H. LEGGETT, president and general manager of the Standard Cons. mine of Bodie, is in the city on a brief business trip.

E. COMERGE, of Paris, and G. Chartier, of Denver, are at Weaverville looking after the interests of the French Company, which has lately acquired large gravel mining interests in that region.

PROF. S. F. EMMONS, U. S. Geologist, and his assistant, J. E. Spurr, accompanied by J. W. Neill of the Viking Company, are in Park City, Utah. The professor will make a geological survey of the district.

MESSRS. W. H. H. BENYAURD AND W. H. HEUER, U. S. Debris Commissioners, accompanied by John F. Kidder, State Debris Commissioner, have been examining some hydraulic mining properties in Nevada, Sierra and Yuba counties.

E. HUHN, superintendent of the Oak Tree mine at Mayhert, and F. Howard, one of the principal owners in the mine, came down from Mayhert to Nevada City, says the *Herald*, and went to San Francisco, whence Mr. Howard will leave for his home at Kansas City, Mo.

British Iron Trade.

The following article is from the London *Times:*

For a number of years past very serious apprehensions have been aroused by the circumstances of the iron industry of the United Kingdom, more especially in view of the progress made by competitive countries. In commercial circles it is now quite a common thing to hear our iron industry spoken of as a manufacture that has ceased to make progress and is doomed to gradual decay. An examination of the returns of our exports for several years past appears to confirm this view, and it is further supported by the returns of the production of pig iron, Bessemer steel and wrought iron during recent years. The statistics of the production of pig iron for the first half of 1894, which have this week been issued by the British Iron Trade Association, show that although the output for that period was more than for the corresponding half of 1893, it is still much behind the output of a few years ago. On the other hand, it is a subject for both surprise and congratulation that we have again recovered, at any rate for a time, the supremacy in the production of iron which in 1890 we resigned in favor of the United States, and stand once more at the head of the iron-producing nations of the world in the matter of output. We append the statistics of the output for each of the years 1883 and 1893:

	1883. Tons.	1893. Tons.
Production of pig iron	8,490,000	6,830,000
Production of manufactured iron	2,730,000	1,364,000
Production of Bessemer steel	1,553,000	1,493,000
Production of open-hearth steel	455,000	1,456,000
Totals	13,228,000	11,143,000

These figures show that, in spite of the increase of more than a million tons of open-hearth steel in the interval, the total quantity of the material produced fell off to the extent of considerably over two millions of tons, the decrease being more especially noticeable in pig iron and manufactured or wrought iron. The decline in the latter branch of the trade is not, however, so much a matter for anxiety, as the wrought-iron industry has been a decaying one for years, and its decay has been almost as marked in some other countries, and more particularly in the United States, as in our own. It is the enormous absolute decline, as compared with the previous corresponding period, that specially arrests attention. Between 1873 and 1883 we increased the output of our iron and steel works by 3,268,000 tons, or 33 per cent, while in the period 1883–1893 we fell off 2,085,000 tons, or 16 per cent.

If these facts stood alone they would be sufficiently alarming, but unfortunately they are allied to other facts that are perhaps still more likely to excite apprehension. In 1883 our total exports of iron and steel amounted to 4,043,000 tons, valued at £28,590,000, whereas in the year 1893 our corresponding exports only reached 2,911,000 tons of the declared aggregate value of £20,609,000. It is a somewhat remarkable coincidence that the decline of 1,132,000 tons in the volume of our exports exactly corresponds with the total quantity of the exports of iron and steel from Germany in the year 1892. This, however, does not mean that the German exports have grown to this extent, or even at all, during the period in question. On the contrary, it appears that the total volume of German exports of iron and steel in 1883 were, like those of our own country, larger than in 1892; but the Germans, in the interval, have greatly improved their position by exporting less pig and more finished iron and steel. The same remark applies to Belgium, our next most important competitor, which exported 434,000 tons of iron and steel in 1883, as against only 406,000 tons in 1893. But while other countries have also diminished their exports, as between the two periods, it will be observed that the falling off in the exports of British iron and steel is much larger than in the other cases referred to. It is manifest, in short, that the world has been consuming a greatly reduced volume of iron and steel, and probably it was largely inevitable that Great Britain, as the chief exporting country, should be the greatest sufferer thereby.

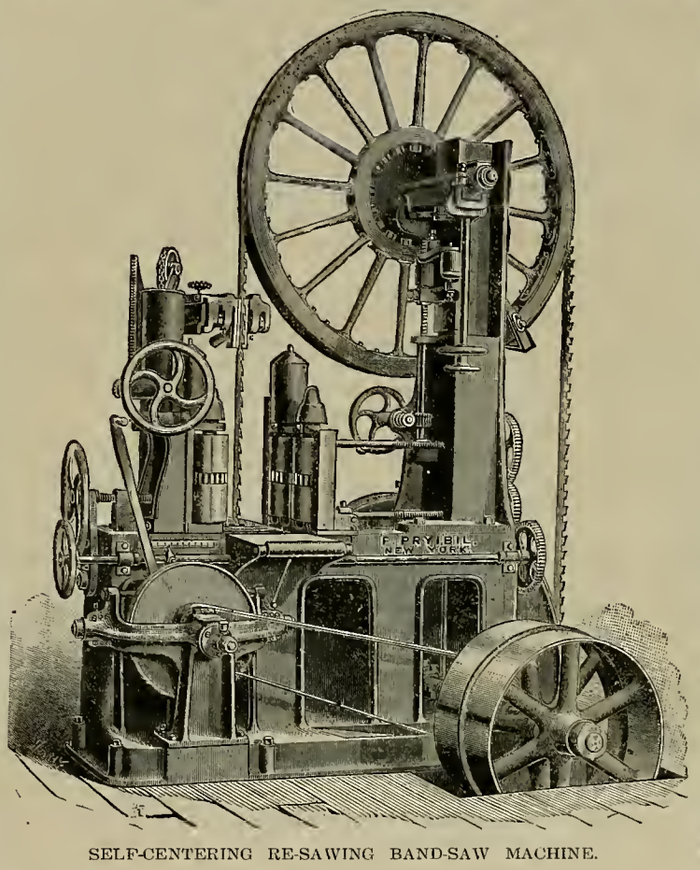
This circumstance, however, does not adequately or satisfactorily account for two other facts of fundamental importance—the first that the production of British iron and steel has largely fallen off relative to that of other countries, and the next that the imports of iron and steel into Great Britain have largely increased relatively to the exports of the same class of goods from that country. In considering the facts of the situation from this point of view, the United States may be left out of account, as being a law unto themselves, and as being, up to the present at least, practically a non-competitive country in this branch of manufacture. What English manufacturers have had more especially to complain of in late years is the success of German and Belgian manufacturers in our home and colonial markets. It will probably be among the things not generally known that more German iron is imported into Great Britain than into any other country. The iron was probably largely in transit for Italy and other countries, while in our own country it had come to stay. During the year 1893 we imported into Great Britain 116,000 tons of German iron and steel, while into the British colonies we imported nearly 100,000 tons more. The whole of the American continent, excepting Canada, did not take more than one-half of the quantity of German iron and steel that the British Empire did that year. Our total imports of iron ores and finished iron and steel of late years have ranged from £6,000,000 to £8,226,000 in annual value. This is comparatively a recent movement, for in 1870 the annual value of such imports, which almost wholly took the form of Swedish bar iron for the crucible steel industry, did not exceed $700,000. England still leads the world in the production of cheap pig iron, which is the basis of the whole superstructure of iron and steel exports, but we have of late years been falling behind in the economical production of the finished forms of the material, where cheap labor becomes the principal factor to be reckoned with. Continental producers have, in addition to cheaper labor, the further advantage of cheaper railway freights, cheaper shipping charges, and cheaper methods of placing their orders. Finally, it is an open secret that in German competition, at all events, contracts are often made at less than the actual cost of production. In other words the Germans, being protected in their own markets by a virtually prohibitory tariff, and being thus enabled to depend upon remunerative prices at home, find that it serves their purpose to keep their works as far as possible fully employed and take what prices they can get outside for the balance not consumed at home. In this way the Germans have for many years past had two scales of prices—one for home markets, which was relatively high, and another for outside markets, which was relatively low.

Apart, however, from these special conditions affecting German competition, there can be no doubt that the iron trade of that country has of late years greatly improved its competitive position in reference to the iron and steel industries generally, and that it now menaces the prospects and prosperity of the English iron trade to a larger extent than has ever happened in the past. Until a comparatively recent date the German iron and steel manufacturers were behind those of England and the United States in the economy of their methods and appliances, so that their cheaper labor did not count for so much as it otherwise would have done. But Germany has now come almost abreast of the English conditions of work, and in some matters is probably ahead. A single proof of this advance speaks volumes of what has happened all along the line. In 1881 the average output of pig iron per furnace in Germany was only 11,609 tons, but in 1892 the average had risen to 21,000 tons. Again, in 1881, the average make of pig iron per workman employed at the blast furnaces of Germany was 136 tons, whereas in 1892 it was not less than 203 tons. This means, in short, that the Germans have within the last twelve years obtained nearly 100 per cent more from a given plant and about 50 per cent more from a given number of workmen, and the result has, of course, been to enable them to produce iron more cheaply than they ever did before. Another advantage accorded to German manufacturers, which is generally withheld from their English rivals, is a considerably lower range of railway rates for export. The German system is devised to develop the export trade and to restrict the imports, while the English railways give no special facilities for exports, and often make an effort to stimulate imports by specially low charges.

The attitude and action of labor has of late years placed English manufacturers at a very serious disadvantage. This has been especially the case during the last three years, chiefly owing to the great coal strikes in Durham, the Midlands and Scotland.

Self-Centering Re-Sawing Band-Saw Machine.

The machine illustrated on this page (from the foundry of E. Pryibil, N. Y.) will use saws as thin as 24 gauge and up to 6 inches wide. It will saw 16,000 to 20,000 feet per day, making a kerf of only 1-20 of an inch, or less, where most resaws make 3-32 to ⅛, or more. The feeding is effected by four strongly geared live rolls, while two smaller idle rolls guide the last end of the stock up to the finish of the cut. A friction device, controlled by a single lever, enables the feed to be instantly stopped or started, and to be run at any speed desired without changing belts. With machines employing step pulleys or gears for changing the feed, one speed may be just a little too much and the next one not near enough, resulting in decreased output. The saw runs between hardened steel plates filled with dog-wood plugs, with the end grain in contact with the saw, and each plate can be accurately adjusted by a single screw. The back of the saw has a bearing one and a half inches long on the beveled edge of a conical roller of hardened steel. What little wear does occur takes place across the full width of the beveled surface, and therefore does not form grooves, as would be the case with a plain roller. The upper guide is counterbalanced, and is adjustable vertically by a hand-wheel. This hand-wheel, the lever for controlling the feed, the hand-wheels for setting the feed rolls, and the scale showing to what thickness they are set, are all accessible from the sawyer's working position. The upper wheel has a rim of bent ash with steel spokes, and the lower one is a heavy iron casting. The lower wheel being thus much the heavier, acts as a fly wheel to prevent sudden and violent fluctuations of speed, as in starting and stopping, and thus prevents the overrunning of the upper wheel, which, being lighter, is capable of following the motion of the lower one without causing the saw to slip or to become slack on the working side. The rims of both wheels overhang the ends of the bearings which are self-oiling. The overhanging feature effects the same result that some makers attain by the use of a clumsy and complicated arrangement of outside hearings. The upper shaft can be angled while in motion. An adjustable spring maintains a proper tension on the saw and renders it much more secure against breakage than the weights commonly used for this purpose, as the inertia of weights prevents them from yielding quickly enough when a chip gets between the saw and the wheel, the result being a broken saw. To provide doubly against such an accident, a wooden block is fitted in the throat between saw and wheel, so as to catch all chips and sawdust and discharge them beyond the rim. The lower wheel is kept free from accumulations of sawdust by a scraper, and the upper one by a brush. The body is a box-shaped casting, in one piece, very strong and rigid, and it can be placed on any good floor without a special foundation. The loose pulley is self-oiling, one inch smaller in diameter than the tight pulley, to slacken the belt when the machine is stopped, and it is provided with a step at the inner edge to cause the belt to shift easily. Diameter of wheels, 60 inches; thickness taken between feed rolls, 21 inches, 12 inches on one side and 9 inches on the other. Height of stock that can be sawed, 30 inches; height from base to top of upper wheel, 10 feet 6 inches; width, 10 feet; depth, 7 feet; speed, 450 to 525 turns per minute, according to kind and width of lumber. Weight of machine complete, about 7000 pounds; length of saw blade, 31 feet; driving pulley, 26 inches.



SELF-CENTERING RE-SAWING BAND-SAW MACHINE.

Electric Hoists and Pumps for Mines.

(*Continued from page 257.*)

The motor is bolted directly to the bed of the hoist and is geared to the drum through a powerful friction clutch. The hoisting is controlled by a lever, actuating the friction clutch, while the motor runs continuously. This has been found to be much better than controlling by a rheostat in the motor circuit, as the liability of a breakdown due to the rheostat getting out of order by short circuits, wearing out of contacts, etc., is done away with. It is also much less strain upon the motor. The hoists are made with either single or double drums and are well adapted for mining, dock or warehouse work.

For ventilating purposes also the C. & C. motor has obtained for itself a great deal of prominence. The motor is supported on wrought iron arms bolted directly to the fan frame. Its circular form and great compactness prevents it from cutting off the area of draft, except at the center, where there is very little action of the fan blade. These motors are wound for various speeds of regulation, being effected by means of field commutation by the use of a suitable switch. They may be set either vertically or horizontally. The merits of this motor, in connection with ventilating machinery, are well attested by the fact of their being used in many instances upon government cruisers.

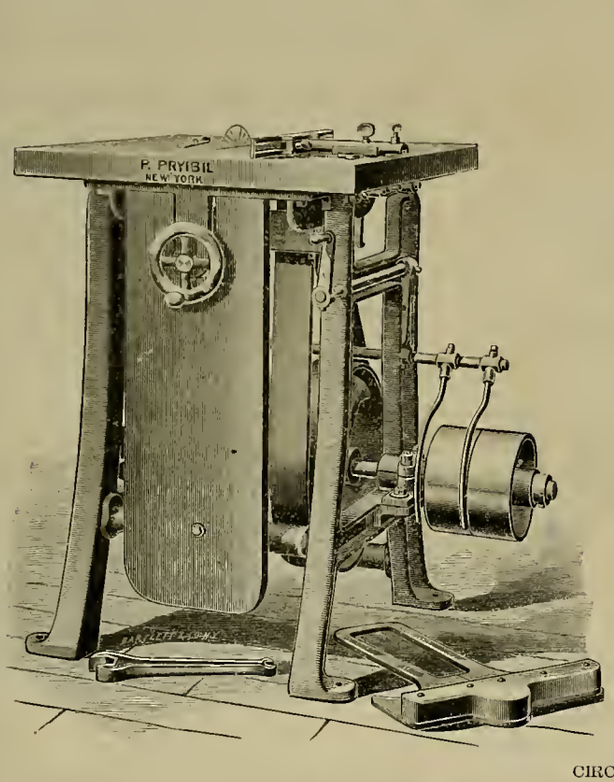
The C. & C. Electric Co. are represented on this coast by the California Electrical Works, 35 Market street.

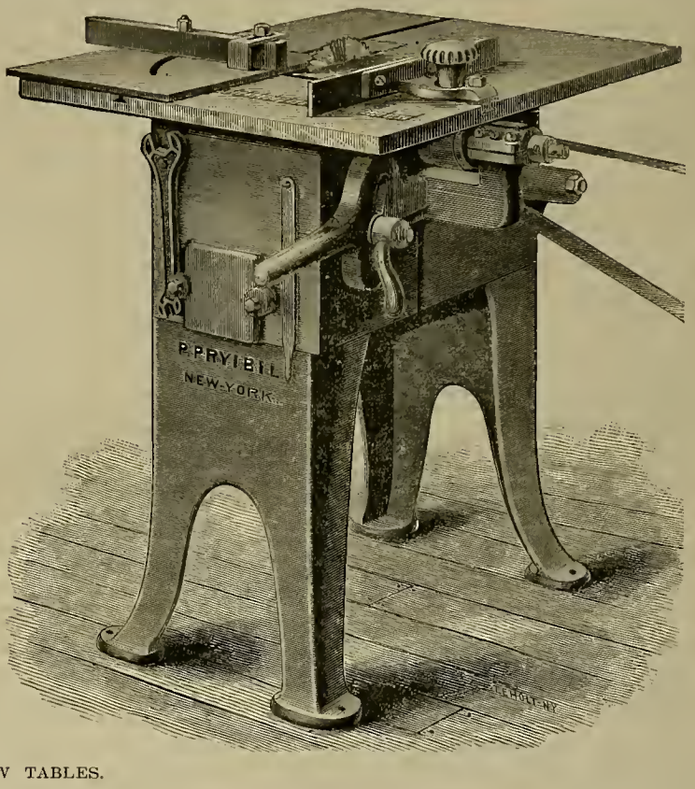
Circular Saw Tables.

The cuts on this page illustrate circular saw tables from the Pryibil foundries, New York. That at the right (No. 4), although suitable for wood, is designed more particularly for metal, ivory, horn, tortoise-shell, etc. The saw arbor is carried by a swinging frame, which is counterbalanced and held securely at any desired height by a clamp screw.

The table is of iron and is set upon an iron box, which catches the sawdust and holds water for the saw to run in, and which is provided at the lower part with a hand-hole for emptying and cleaning. The table is provided with an adjustable gauge and with a carriage with miter-fence. A removable throat-piece gives access to the arbor and provides for the use of a wabble saw or groover. The arbor pulley is three inches diameter and three inches face, and should make about 3500 turns per minute. The countershaft generally has an eighteen-inch pulley for a three-inch belt, and eight-inch self-oiling, tight and loose, for a three-inch belt. It should then make about 600 turns per minute. Weight, without countershaft, about 395 pounds. Size of table, two feet six inches by two feet.

The cut at the left illustrates a very accurate machine, designed for fine, accurate work, such as piano actions, and for electrotype and stereotype work. The arbor frame is stationary and the table of iron, and is adjustable, being supported at the back by pivot screws, and at the front by two cams operated by a hand-wheel and screw at the front of the machine. Thus a true adjustment is always obtained and the table is well supported. Access to the saw arbor is obtained by lifting the table, but a reversible throat-piece provides for the use of stiffening plates on the saw, and for the use of a wabble saw or groover. An adjustable rip-gauge is furnished with each machine, and a carriage, of iron, when ordered. The countershaft is mounted on the frame of the machine or made separate, with floor-standards, as ordered. The arbor pulley is two and one-half inches diameter, three and one-half inches face, and should make about 4660 turns per minute. The countershaft generally has a sixteen-inch pulley for a three-inch belt, and eight-inch self-oiling tight and loose, for a three-inch belt. It should then make about 730 turns per minute. Weight, with countershaft, about 400 pounds. Size of table, two feet six inches by two feet.





CIRCULAR SAW TABLES.

Loss in Scorification Assays.

The loss of gold and silver in the scorification assay is a considerable, though rather an indefinite, quantity. Messrs. W. P. Mason and J. W. Bowman have been making some experiments to determine the amount of this loss. From a number of assays they found that with silver the loss by the process was 2.54 per cent, of which 1.99 per cent was in cupellation and 0.55 per cent in scorification, says the *Engineering Magazine*. With gold the loss in the entire process is 0.87 per cent, of which 0.296 per cent was in cupellation and 0.574 per cent in scorification. These results show larger losses than is commonly supposed, and perhaps larger than is usual. But they serve to explain in part some of the exceptionally high records made in smelting, where the comparisons are based on the scorification assay. It remains now for a new series of experiments to be undertaken to determine losses in the crucible assay for gold and silver. Some figures are quoted in the books, but they are not regarded as altogether reliable, and there is always the personal equation of the assayer to be taken into the account. In his new book on assaying, Mr. H. V. F. Furman advocates the determination of silver in two or more portions of the ore by scorification, and the gold in two or more portions by crucible assay. This is the Colorado practice. Most ores yield higher silver returns by scorification and higher and more uniform gold results by crucible assay. The reason stated by Mr. Furman why the crucible method gives better results on gold, is that it allows larger quantities to be taken for assay, and hence a larger gold button for weighing. Both methods can, of course, be made more accurate by running a number of assays and combining the buttons in parting. The claim for the remarkable delicacy of the fire assay for assay of gold and silver still holds good, if care is taken and all sources of error are understood and proper allowance made. In ordinary work the error should not be more than half an ounce silver (and much less gold) per ton; while in delicate scientific experiments, using specially prepared litharge and micrometer measurement of buttons instead of weighing, Mr. J. S. Curtis has determined (and proved) quantities of silver down to five and three cents a ton of ore.

Steamboating for Gold.

Extravagant stories are told about the wealth of gold sprinkled throughout the Snake River country in Idaho. As a general thing, the gold is very fine, the particles being of so light weight as to be elusive. Save when worked on a large scale, it is difficult to make good wages in recovering the gold. Numerous bars along the river would prove profitable could water be commanded for sluicing or hydraulic purposes. An adequate supply is hard to obtain on account of the slight and gradual fall of the stream and the level character of the outlying lands. To overcome this lack of water, as well as to insure sufficient dumping ground, a big floating gold-saving dredge has been constructed and is now at work on the Idaho bank of the Snake river, about ten miles above Payette.

It is a stern wheel flatboat propelled by steam. Substantially constructed, sixty-five feet long and twenty-two feet wide, it is equipped with a thirty-five horse-power marine engine and boiler and adapted in every way for navigating Idaho's great waterway. With a slight alteration, it could be transformed into a steam dredge and used to scoop up sand and gravel from the bottom of the stream. That has never been attempted. As in the past, operations are now confined to working bars out of the bed or channel of the river. The method pursued is to anchor alongside one of these gravel deposits and by the use of scrapers bring the material to be handled within the reach of the gold-washing machinery with which the craft is rigged. The gravel is scooped up by buckets attached to an endless chain.

There are forty-eight of these receptacles on a belt sixty feet in length, and each has a capacity of about twenty pounds of dirt, which is delivered into a hopper. This is also an agitator, and the process employed may be described as a steam rocker, with the exception that it has an end motion instead of one sidewise. The gold is caught on copper plates with quicksilver. The tailings are carried off in sluice-boxes by the force of a stream of water of 150 mineral inches, supplied by a China pump, run by the engine which drives all the other machinery. The gravel is worked so thoroughly that no gold escapes in the tailings that are dumped into the river. An average of 100 tons of gravel is daily handled, and for this work three men are employed—an engineer, one to work the scraper and another who shovels the dirt into a pile so that the buckets can scoop up a full load.

The bar now being worked covers an area of ten to fifteen acres. The gold is on top or close to the surface and will not pay to handle to a greater depth than one foot to eighteen inches. This shows a value of one and one-half to three cents a pan. A clean-up is made every night, and the average of the runs for the first three days was very satisfactory to Thornton Williams, the owner of the craft. He says he expects to take out upward of $100 a day as long as he works, which will be until cold weather sets in. When he has gone over the bar which now engages his attention, he will tackle another.—Helena Independent.

Concentrates.

BAKER CITY, OR., thinks it ought to have a mining bureau.

TWO HUNDRED MEN are digging out gold from the sands of the La Platas, Col., at the rate of $3 to $7 a day per man.

MESSRS. BROWNLEY AND SNOW took out a $4000 pocket from their mine near Tuttletown, Tuolumne county, last week.

IT is reported that Smith Brooks of New River, Trinity Co., has struck a good ledge in the Mary Blaine mine of that place.

THE *New Era* says the altitude of Kennedy is 5525 feet, which is 1000 feet lower than Austin and about 900 feet higher than Winnemucca.

THE De Lamar Mining Company of Lincoln county, Nev., is building a 200-ton ore bin at the Monitor mine, and expects to have their mill running before snow flies.

KENNEDY, NEV., is overrun with men in search of employment. Work at the present time is hard to get, as all positions in both mills and mines are filled.

DURING the month of September there were filed with the clerk and recorder of Jefferson county, Montana, the location notices of 220 quartz claims and 19 placer claims.

SAGEBRUSH is utilized at the Imperial mill, Kennedy, Nev., for fuel, and it is said to be cheaper than any other fuel, although pine and cedar are delivered at $5.50 a cord.

THE Hecla Company of Glendale has declared a dividend of one per cent, aggregating $15,000, payable the 25th inst. The Hecla is the chief lead-producing mine in Montana.

A RECENT week's gold receipts at the Helena assay office broke the record for all previous weeks in the history of the office, the amount being a little over $120,000, representing 130 deposits.

WE understand that the old Wisconsin claim, near Forest City, Sierra Co., is to be reopened. Henry Grant is one of the principal owners, and the work will be done under his direction.

MR. G. C. TUNSTALL, gold commissioner, who has returned from Similkameen, reports that mining prospects in that part of British Columbia are good, and he has no doubt but that the output of precious metal will be large.

BAYLEY'S REWARD, the pioneer claim of the Coolgardie, West Australia, gold field, yielded during the twelve months ending April 5th £234,000 in gold. Since that date the present company has added approximately £60,000 more to the output.

THE Baker City *Democrat* is informed that an important mining deal has just been consummated in Grant county, Oregon, the Sloan & Haskell placers on Elk creek passing into the hands of Connecticut capitalists. It is said that the purchase price was $40,000.

ANOTHER mining deal for the vicinity of the Seven Devils is to be recorded. The Placer Basin group, consisting of four quartz claims owned by E. M. Barton, J. A. Dummick and Harry Siskrow, has just been sold to Captain Miles Standish of Salt Lake for $15,000.

IT appears now to be the general opinion that if the bottom of the Comstock lode should drop out from end to end, there would be some certainty of a boom in the market, with possible bonanza prices. Ore developments do not seem to count any more.—Virginia Enterprise.

ADVICES from Chile say that in Coquimbo the gold fever continues developing. Andacallo is not the only place at which gold has been struck, but at Cruz de Caras also, where the range is in a virgin state. In many parts of the province of Anoud gold has also been struck.

THE cyanide machinery for the Black Hills Gold Extraction Company is now all in and is rapidly being put in place. Just as soon as this is done the plant will start up for a long run. This will be good news, for several mines have been holding ore for this plant to reduce and will send lots of precious ore from the hills near Deadwood, Dakota.

THE town of Plymouth, Amador county, is apparently beginning to enter upon a regular boom. There are several new mines being worked, and quite a lot of prospecting going on. Old houses in the town, which have been unoccupied for several years, are being repaired and fixed up for reoccupancy. The hotels are patronized to their full capacity.

THE miners in all the dry diggings of small creeks and high mountain gulches are preparing for the winter storms by drifting and getting out pay gravel for washing when an abundance of water is attainable. If we should have as good a season as last winter a great amount of gold will be realized from the dry diggings only workable in winter.—Yreka Journal.

THE Salt Lake *Tribune* says: The plans for the enlargement of the Marion mill, in Camp Floyd district, are now well under way, and before winter sets in the output of this property will be doubled. The capacity of the mill is to be increased from 50 to 100 tons daily, and the mine is in such a state of development that any amount of ore can be taken out.

THE famous Pichacho placer mines near Yuma, located about a year ago by a non-resident English capitalist, and held by aliens, have all been relocated by parties backed by Montana mining capitalists, on the grounds that the mines are held and owned by aliens contrary to United States mining laws. The English company will not be allowed to work the mines until the case is decided by the courts.

THISTLE SHAFT is reported to be doing better than ever before. They have just struck into the main channel, and the gravel is said to be rich. The company employs seventy men, not including those on contract work. Five new dwellings are going up at the mine. This mine has fully demonstrated the great wealth which lies bidden in the ancient channel in the ridge extending from Gibsonville down to La Porte.

A BIG mining deal is reported to be nearing consummation. Agents of an English syndicate are now in the Coeur d'Alenes concluding negotiations for the purchase of four of the most valuable properties—the Poorman, Tiger, Gem and Frisco mines. The plan is to operate them under one management, thus not only reducing the expenses of working the properties, but placing the owners in a position to better dictate freight rates, smelter charges, etc.

THOS. S. NOWELL, of the Nowell Gold Mining Co., is well pleased over the mining outlook of southeastern Alaska. He asserts that the outlook has never been better within his knowledge of the country, and in proof of the sincerity of his statements he says he intends to add twenty stamps more to the mill at Berners bay, and that before next fall he intends to have forty more running in the Basin on ore from the Ground Hog; nor does the work stop here, for the next spring will undoubtedly see the erection of a large stamp mill on the group of claims near the Comet.

THE London *Mining Journal* says: The Rand Central Ore Reduction Company has developed a new cyanide process, known as the Siemens-Halske. In the MacArthur-Forrest process, the gold, after having been extracted from the tailings, is precipitated by means of zinc shavings; while under the new method the gold is deposited by electrolysis on two thin lead sheets. The process is being used at the Worcester property, where 3000 tons a month are being treated. The Reduction Company is also testing an aluminum process.

THE machinery for saving the gold from black sand was shipped from St. Paul, Minn., and is expected to arrive in Portland to-day. It is the intention to ship it on the Alice Blanchard, on her arrival in Portland, direct to the Coquille river, and it will not be long before several of the new machines will be in operation in the vicinity of Randolph. It is to be hoped that the originators of this new process will meet with success, as it will be a great benefit to this county to see all the black sand mines running in full blast once more.—Marshfield Sun.

THE new air compressor ordered by the Centennial-Eureka Mining Company from Fraser & Chalmers, Chicago, is undoubtedly the largest machine of its kind ever used to drive the power drills at any Utah mine. The compressor is a Rieder duplex, with 18x30-inch air cylinders, operated by a twin compound Corliss engine having 18x30 and 28x30-inch cylinders. Its weight is 120,000 pounds, and an exact duplicate of it is in use at the Milwaukee mine at Gem, Idaho. When the Centennial-Eureka gets its new compressor in place the property will be equipped with power as no other mine in Utah is and will enable the company to advantageously open up new ground.

THE plans for the new Bullion-Beck mill provide for one of the most complete mills in Utah, the total cost of which will be $50,000. The process will involve the purchasing of the following items of machinery: Two 80-horse power boilers, one 10x20 gyrating crusher, one Dodge crusher, three sets 16x36 Cornish rolls, two elevators, ten sizing screens, to be arranged in two trains, six double three-compartment jigs, two pulverizing mills, ten concentrating vanner tables. The company owns already an engine and one Dodge crusher. When the mill is finally got into working order the company contemplate putting in an amalgamating plant. The plans for it are already drawn.

A HUGE dredging plant is being built at the B. C. Iron Works, Vancouver, for the Fraser River Mining & Dredging Company. The plant consists of a screw 130x33 with a "clam shell" dredger, having a lifting power of eight tons at a distance of forty feet from its center, which will deliver sand and bowlders alike (and gold, too, it is hoped) into the sluice-boxes, to which water is supplied by two eight-inch centrifugal pumps. A new arrangement is the "water guard" or screen, shaped like an enormous snow plow, which being placed ahead of the dredger divides the current and permits work to be carried on in comparatively calm water. Power is supplied by no less than five separate engines, aggregating forty-horse power, while two others, with fifteen-inch cylinders and six-foot stroke, drive the stern wheel. Steam is supplied from a twenty-four-horse power boiler. The working of the new dredge will be anxiously watched.

The Lemhi Placer.

The figures of the season's washing of the Lemhi company are made known. A circular has been issued to the stockholders, containing a statement by President J. J. Hagerman and the report of Aug. J. Bowie, the consulting engineer, from which the following extracts are taken.

"The work of the last two years has proven beyond peradventure that the water supply of the company is wholly inadequate for hydraulic mining.

"A reconnaissance of the Lemhi was made, and finally, after several surveys, a line has been located and staked from Hayden creek to Kirtley creek, where your claims are situated. This is the highest available line for the introduction of water for hydraulic purposes on your mines.

"This source of supply will give us 3000 to 5000 inches of water during the entire season, say nine months, unless impeded by severe cold.

"The work which has so far been carried on at Kirtley creek under the most adverse circumstances, demonstrated the fact that with 120,000 inches of water we have obtained some $26,000, yielding an average of twenty-two cents per inch of water used. The results so far obtained I considered most satisfactory. It is demonstrated that, even under these most disadvantageous circumstances, we have been able to have a return of twenty-two cents per inch of water used, which means a daily output of $600, with 3000 inches of water.

"An increase of one cent per yard on the average yield of the gravel during the last two seasons' washing, would give us a yield of $27,000 per month, with 3000 inches of water, which on a nine months' run would be equivalent to $243,000, placing the value of the yard at only six cents.

"Comparing these figures with those obtained at other hydraulic properties in the same stage of development, the results are double those of any large hydraulic mine upon which millions of dollars have been expended.

"We have reached a point where the water must now be brought to supply this property to make it a paying proposition, for without it you cannot expect to have an adequate return on your investment. In view of the comparatively small cost of the entire enterprise complete, and in the light of all developments, which have been a crucial test, I unhesitatingly advise the construction of your ditch as rapidly as work can be economically prosecuted."

The stockholders are asked to pay a voluntary assessment of thirty cents per share, which will amount to $150,000; to pay off the indebtedness of the company, $100,000.

The figures of the estimated cost of the proposed new ditch from Hayden creek to Kirtley creek are not given, but it is probably about $200,000, and a move is on foot to increase the capital stock from $500,000 to $1,000,000, which it is presumed is intended to pay for it.

Bitter Root Gold.

There is considerable excitement in Spokane over the finding of rich placers in Idaho, on French creek, fifteen miles from Pierce City and about twenty miles from where Colgate's body was found, says a Spokane correspondent of the Missoula *Democrat*. Several Spokane men explored the wilds of the Bitter Root mountains and with good success. Here they have uncovered rich diggings and are putting in hydraulic works and getting in shape for a permanent camp. From tests made they expect to clean up from $15 to $20 a day for each man's work. Cabins are being built and enough supplies laid in to carry them through the hardest kind of a winter. One of the party, M. C. Murtagh, is now at the Gillette hotel arranging for the last shipment of supplies.

We are satisfied that no prospector ever visited that country before, said Mr. Murtagh to a *Chronicle* reporter. It is only about fifteen miles from Pierce City, but you must remember that about seven and one-half miles are on edge. We have made a trail now, but the first trip was an experience. The rocks and hills are piled up just like ocean waves. We forced our way through the thickest kind of underbrush, climbed over boulders and down bluffs and scrambled over fallen trees piled up twenty feet in height. But we got through finally.

It is a magnificent timber country. The forest is so dense that it is always damp, and even when the underbrush is cut and piled up it will not burn. There are places where the pine needles are matted two and three feet deep upon the ground. On our land alone, it is safe to say, there are at least a dozen huge red cedar trees that are from nine to thirteen feet in diameter, and so high that it hurts one to look up to the top.

Besides the placer ground we have located ledges of free-milling gold quartz, samples of which I intend to have tested before my return. In short, the inducements that country offers to mining men are such that it seems strange it was not thoroughly prospected several years ago.

We had some visitors this summer. A party of United States soldiers came up the creek and stopped at our camp, made many inquiries, took notes freely and then faced about and went home. They did not state the object of their trip, but it is supposed to have been for the purpose of locating a new road over the range.

An Ore Dredger.

Up on the Mesaba range a new invention for handling ore, known as the Bates ore dredger, is receiving quite a good deal of attention from mining men. The construction is very simple, although the invention is by some considered a great achievement in the science of mining. No cars, tracks or equipment are required in the mine. First, a tower 72 to 100 feet, is erected on either side of the ore body or other material to be removed. The set towers are on platforms mounted on railway tracks, and the hoisting engine and boiler are placed on the main platform. A two and one-half inch wire cable is stretched between the two towers, and on this cable is conveyed the carriage from which is suspended the dipper. This dipper is a huge affair, weighing over three tons, with four leaves, which open and close at the will of the operator. The dipper, when opened, has a spread of nine feet, and gathers two and one half yards of dirt to a load. It is lowered slowly to the ore body and not dropped from a height, as was at first necessary. The action is such that as the leaves are closing the dipper digs downward until fully closed, and fills itself without the least trouble. The action of the dipper pulls down instead of upwards until loaded. The dipper is then hoisted and carried to the pocket over the car and emptied. When the cut is sufficiently wide both hoisting and carrying can be done at the same time, thus increasing the speed. The best time in loading a twenty-ton car was fifteen minutes, but when everything is in good working order it is expected to load five cars an hour.

Practical mining men have expressed the opinion that this invention solves the problem that will confront Mesaba range miners when the ore is so deep down that loading with steam shovel is no longer possible. The dipper will go down after the ore at any depth.—American Manufacturer.

Placer Gold.

To the Editor: —"Surely there is a vein for the silver and a place for the gold where they fine it." What was true in Job's time is equally so now; for, while silver is found in veins, gold is both where they find and "fine" it. Much has been written on the origin of placer gold, and the ground still remains rich in unlocated "float." The article of Mr. R. L. Dunn is timely and calculated to bring out the practical experience of others. With this object in view, I beg to differ from Mr. Dunn in this—that gold-bearing ledges are not as rich in coarse gold in depth as on or near the surface, and in consequence placers equally as rich as those of the ancient rivers could not be made from the same ledges at this time. It is a common experience with all mining operators that the veins do not go down, and it is a still more common experience that the ore bodies are simply "blossoms" that do not lead to fruit. These surface veins vary in size and extent with the locality in which they occur. In Custer county, Dakota, are found immense deposits of quartz (surface concentrations) that fill a whole valley, but rest like a saucer in the hollow of the valley. Being auriferous, they added a larger per cent of gold than the veins enclosed in walls, and their presence lends color to the theory that the bulk of the placer gold came from the quartz masses deposited in the original gulches from the overflow of the veins at the time of their formation. True it is that a section rich in placer gold is poor in its veins, for as a rule a coarse gold or pocket section contains few milling ledges. As a rule, coarse gold is found in soft formations both in the beds of streams and in place. In the bedrock the gold slips over the polished surface of the crystalline rocks and is caught in the rough bedrock of the softer slates, as is seen in the Shepherd mine near Railroad Flat. In the soft, decomposed surface rock of the famous Morgan mine at Carson, $3,000,000 was taken from one surface pocket; but on sinking at this point the ore changed to a sulphuret milling proposition. Throughout the coarse gold sections the hills have a capping of soft talc slate or soapstone, which rests on harder slates. In these soft surface cappings are found pockets of coarse gold that are limited to the depth of these surface formations.

Accompanying many of the placer streams are bodies of limestone which show remnants of what were once veins of considerable size but are now, in many places, but the feather edge of the vein. A careful examination of most pocket sections will show that the coarse gold occurs at the point of contact of the surface feeders and the vein, while the much greater source is from the feeders themselves. It is evident that at the time when the fissures were formed the surface of the hill containing the vein was shattered and innumerable crevices formed. This condition did not extend downward, as the country rock in depth was solid and held in place by the surrounding rock. This shattered surface of soft rock was permeated by the vein matter and as these "feeders" were horizontal, or almost so, the gold readily formed in large masses, while in the vertical vein it was perhaps more evenly, but much more minutely, disseminated. These surfaces of soft base rocks rapidly wore away and filled the gulches and streams with their golden contents. Since then these naked hills have been clothed with verdure and the change from arctic to semi-tropic climate has almost checked the erosion of the hills. In proof of these statements I can refer to innumerable instances coming under my observation in Dakota, Colorado, Mexico and California, which but for the space required I would be pleased to quote. If the reader doubts the truth of my conclusions, he has but to go to an experienced mining operator with a piece of rock rich in coarse gold to be told: "Your mine is no good as a milling proposition. It is simply a surface pocket that no one but a pocket hunter would invest in." E. H. Schaeffle.

Black Sand Mining.

Prof. Washburn, of Corvallis, gives the following account of the beach mining on South beach, below Newport, Oregon: Along the beach south of Seal Rocks considerable activity is shown by resident miners and others in extracting fine gold from black sand, which is extremely abundant. Some of this sand yields fine returns, and some is not worth working. One area, not exceeding twenty yards square, is said to have yielded $16,000 worth of the real article not very long ago. The scene of operation is always at or near the point where some little creek contributes its mite to the ocean. Its water is led into a hopper into which gravel and sand is shoveled by the industrious miners. The fine sand, separating from the coarse gravel is carried through the sieve, ultimately reaching a long sluice box of matched flooring, about two feet wide, down which it is carried by the water. These sluice boxes are sold by Banta & Wincke, and previous to being used are soaked in a chemical solution which has such a strong affinity for gold that ninety per cent of all the gold in the sand, it is claimed, clings to the sluice and is saved. Be that as it may, the writer saw a generous coating of "the yellow" on a box beneath one sieve, the result of about six hours' work. Just what this chemical is is a secret of the inventors. The boxes are prepared by them and warranted to last a certain length of time; are sold to would-be miners, who can obtain a renewal of the chemical from time to time at a nominal cost. Parties who are working some of these claims tell me they are making $2 a day each, two men to the claim, which is fair wages for these times, and far better than doing nothing. The returns frequently exceed this, and have been known to reach as high as $20 a day for a series of days. The gold is brushed off the boxes, and when enough is collected to warrant a cleaning up, it is treated with mercury and the product sold to parties who forward it to the mint.—Del Norte Record.

Working Beach Sands.

To the Editor:—I notice with interest in your journal under date of October 13th, comment on an article of mine which appeared in the San Francisco *Evening Bulletin* of August 25th, in regard to "Sea Shore Gold and Black Sands." As your correspondent, Mr. Paul, made no mention of the process, I thought your readers might be interested in additional facts bearing on the matter. When I first attempted to solve the difficulties which all workers in black sand that I had seen maintained, I found in practical experiment that they, as well as myself, up to this time were off the trail, so to speak. Upon reversing the order of my proceeding, I at once found I was on the right track, and successfully accomplished my object for rapid separation, little expense, saving of magnetic ore, the float and fine gold, and where water is scarce it is used over and over again. A water-tight tank, movable or permanent, encloses the contrivance used, in which it is entirely submerged, whether large or small, while in operation, being so constructed as to flow the worthless product, instead of the water, which is conserved or wasted at pleasure after recovery of the floating particles. The water leaves the top level water mark in a partially quiescent state to an adjoining tank, where the particles, if any, are further concentrated and the water used over again. The sand is shoveled or dumped into the mouth of a hopper, which reaches the integral parts of the contrivance, the top of the tank being open and water always at or above water level. An electric current is utilized in such manner on the material as it passes through this contrivance in connection with the parts submerged therein, that a perfect separation is made of the iron in its own compartment, for which a separate outlet is made, also for the free gold. In some deposits the concentrated iron, to which particles of gold adhere, are oxidized, and if pressed through steel rolls the brightened surfaces are then susceptible to the mercury and the gold thus secured. A proper fire retort on a large scale will, however, give still more profitable results.

The cost of separating deposits carrying gold and iron by the above process would be very small; and a tank 8x8x10 feet would hold a contrivance capable of using 150 tons of beach sands per day of ten hours. Various methods might be used to deliver the sand to the hopper. The cost will vary according to location. Wherever located, the tank must stand sufficiently high, if permanent, to permit the waste material to drop underneath into a car or chute, to land it easily out of the way. In case the machine was on a dredge, the material would be lifted, delivered at one end, run through the machine and chuted to the other end to the water. In this way, bars or protected beaches where gold sands were bedded, could be worked rapidly and to great advantage. The power of the dredge could be used to pump the sands beneath by suction and run them over screens before reaching the inlet; a great amount of material could be utilized in this way. A syndicate of workers could adopt a machine for co-operative work on and along a great many parts of the Pacific coast and thus quintuple their daily efforts. A small storage battery for electricity, together with the service of one man, outside of pumping the water or elevating the sand to the hopper, would be all the power required to operate the concentrator. Abundant water, under slight pressure and control from any reservoir, would be of great advantage where work was desired on a large scale. If, as many maintain, these black sand deposits, which carry gold, extend inland some distance from the present line of beach, a permanent place could be found to work them, unaffected by the tide; and by excavating to sea level we could get the same deposit as is now made at the tidal line, at least in the vicinity where such deposits have been known to exist for years. If some enterprising men with capital and energy would assist me, I feel confident that rich returns would result and opportunities given to enable honest laborers in large number to secure values which at present are lying in a dormant, useless and unprofitable condition. This system should be attached to hydraulic, drift and placer work, and in some places it would be invaluable on the tailings of ordinary workings for which it can be adapted. E. W. Keeler.

San Francisco, Oct. 20, 1894. 712 Sutter St.

A Hoodoo Placers.

A representative of the *Miner and Electrician* visited the Hoodoo placer camp in Latah county, Idaho, during the past month and found the camp fairly prosperous. This district is reached from Palouse City, Wash., by a wagon road about twenty-four miles long and a good trail up the main Palouse river which is fifteen miles more to the summit. A gulch which gives the district its name was discovered twenty-six years ago by Frank Points, who has made several small fortunes there. Since that time the steep and short gulches have been worked every spring as long as snow water lasted and after that the bed of the main creek has been drained and cleaned up in places and much gold recovered. The latter form of work has been rather desultory, and in fact all the work has been on a small scale and conducted without capital or suitable appliances. There are one or two small ditches with a small flow and light head, but no systematic and thorough hydraulic work has yet been attempted. At the mouth of California gulch as high as $18 a day to the man has been made with rockers, and from the original discovery claim $12,000 was taken out, and at another point the Chinese have taken out at least $8,000 and how much more no one knows.

At present there are about twenty white men and something over that number of Chinamen on the ground, while each spring sees three times as many miners at work there.

The gold seems all to come from the old glacial wash which is high up on the bank, and which consists of a yellow gravel very different in all respects from the wash to be found in the creek bed. Where the steep gulches cut this, gold is always found, but between the gulches the creek bottom shows no pay dirt.

A company has recently been formed from among the employes of the Waltham Watch company to work some of this high ground by bringing in a ditch that will cover the points between a number of these gulches, and good results are looked for.

Lower down steam an Ohio company has taken up some ground and will bring water to it and develop it in a thorough way.

The county commissioners have been applied to to extend the wagon road from the mouth of the main gulch up half a dozen miles to reach the most important claims. A number of the county officials have interested themselves in the matter and the next season will probably see some important changes in this old camp. It has been learned from the banks of Palouse City and other reliable sources that the amount of gold produced this year will be about $10,000, exclusive of that the Chinese take out. Another year may see this sum trebled.

From the Yukon River.

William H. Paddock, E. J. Kendrick, J. P. Snyder, F. Jensen, C. Heinecke, W. Patrick and G. Schroeder came out from the Yukon last Monday evening, says the Alaska *Mining Record*, bringing the first news of the season from the interior over Chilkoot pass.

Mr. Snyder, with Kendrick and Robert Henderson, went up the Hootalinqua river and spent some time prospecting. Mr. Snyder says that a color can be found any place on the river, but the gold is not in sufficient quantity to justify one in working the most of the claims. Men who were at work there averaged about $3.50 per day. The party next went up the Pelly river, where, like the Hootalinqua, gold was found on every hand. He says that at first it naturally excites one, since it is no trouble to find as high as 500 or 600 colors to the pan, but the gold is so extremely fine that very few claims there justify one in staying. They could make but $5 a day with a rocker.

Two men, Peter Johnson and Julius Jensen of Douglas island, were working with a pump on a raft in the river, running the water to their ground, and in that way were able to make about $10 each per day. There were no provisions at Pelly, and Snyder and his companions were compelled to go to Sixty Mile for a grub stake. The Indians had also all left Pelly on account of the scarcity of provisions. Those who remained were fully equipped for the emergency.

In answer to a question asked Mr. Snyder as to what success he thought a hydraulic apparatus would be on Pelly river, he said the ground was so level that there would be difficulty in disposing of the waste, though the gold was in sufficient quantity to work one successfully under ordinary circumstances.

He is of the opinion that the tributaries of Forty and Sixty Mile creeks afford far better prospects than those of Pelly and Hootalinqua.

W. H. Paddock of Juneau has had two summers in the interior, and is well acquainted in the vicinity of Forty and Sixty Mile creeks. He reports that a new discovery on Glacier creek, a tributary of Sixty Mile, bids fair to rival the prosperous Miller creek, though the latter is giving better returns this year than last. The output of that creek this year is placed at $125,000—a sum not at all insignificant for a small stream. Some have taken out as high as $18,000 this summer, and the dirt runs from one cent to $4 per pan. Nothing has thus far been heard from the discoveries made last year on Birch creek.

Scientific Progress.

Interesting Experiments with Coal Dust.

A series of interesting experiments in shot firing and its effect npon coal dust took place at the Lower Duffryn collieries, Mountain Ash, on Augnst 6th. The object of the experiments, which were conducted by Mr. Gwilym Jones, the manager, was to determine the behavior of various explosives when covered with coal dust from the two-foot nine-inch and four-foot seams, both from roads and face of stalls. The first shot consisted of one and one-half pound of gnnpowder covered with a small quantity of fine coal dust from the two-foot seam roadways. The effect was a very large flame, which rose in the air to a height of about ten yards and produced an intense heat. The same qnantity of gunpowder was then tried with no coal dust, and resulted in a very mnch smaller and clearer flame. The next shot consisted of seven balls of compressed powder covered with some coal dust from the four-foot seam, and the same resnlt was experieuced as in the first experiment. A quantity of fine coal dust from the pit screens was tried with one pound of gnnpowder and two balls of compressed powder. This gave a larger flame still, accompanied with very great heat. The effect of experiments upon the dust from the face of the workings created some amount of surprise. A quantity of dnst from the stalls in the four-foot seam was charged with one pound of gunpowder and two balls of compressed powder, and resulted iu a larger and greater volume of flame and heat than that of the old dust. Half a pound of robnrite (equaling oue and one-half ponnd of gunpowder in strength) was tried in the same amount of dnst. Fired electrically, it made a loud report, bnt there was no flame. Half a ponnd of ammonite fired with small coal from the face of the four-foot workings, and auother charge of one pound of compressed powder covered with fine dnst, and placed within a short distauce of each other, were fired electrically. The former was fired first and the latter immediately afterwards, to test the firing of dust in the air. The first shot caused no flame, but the second caused a large flame in the dust while in the air. Three-qnarters of a ponnd of carbonite was also tried, but no flame was emitted. Mr. Joues then experimented in an arch thirty-five yards long, with the floor and sides constructed of crossed timber. Strips of boards were run along the sides in three rows to hold dust, so as to resemble the roadways underground, and coal dust was strewn about the floor, roof aud sides. The first experiment was made with a charge of oue ponnd of gunpowder to resemble a volume of gas, aud to see whether it would ignite the dust and produce a continuatiou of the flame through the arch. The powder fired in the ordinary way, bnt did not ignite the dust. One pound each of gun and compressed powder were tried, and ignited the dust immediately on the explosion of the powder, but, there being no current of air, the continuation of the flame did not take place. Experiments with cannon were then made, but did not cause an explosion of dnst, the place proving not very suitable for the experiment. The experiments were admirably conducted, and proved very interesting to the large number of people who witnessed them. The result showed very clearly that the ordinary gnnpowder, both loose and compressed, would fire the dust, whereas the high explosives made no flame.—Iron and Coal Trades Review.

The Direct Production of Zinc in the Blast Furnace.

In a paper recently published in the *Berg-und Hutten mannische Zeitung*, Mr. W. Hempel, after reviewing the methods proposed at different times for the reduction of zinc ores without the use of retorts, describes a number of experimeuts made in this direction by himself at the Technical High School at Dresden. It was snpposed that metallic zinc might be separated from furnace gases in a melted form by subjecting the current to the action of a centrifugal machine at a temperature below the boiling point of the metal; but a trial made at 470° Cent. proved a complete failure, only zinc dust and oxide being produced, aud other experimeuts showed that the nature of the product of ordinary distillation depended not merely on the nature of the gaseous atmosphere in which the zinc vapor forms, but that the degree of dilution is also of importance. Thus, in the reduction of zinc oxide in the Silesian or Belgian furnace, large qnantities of zinc dust are formed in the earlier stages of the distillation, liquid zinc being only obtained in a subsequent stage of the operation. This is due to the large quantity of indifferent gases given off by charge at first, which carry away a considerable amount of zinc as vapor before it can coalesce into the liquid form. The received opinion that zinc oxide is only reduced at temperatures above the boiling point of the metal is considered by the author to be erroneous, and that it actually takes place at a strong red heat. The presence of uncondensable gases in large quantity being a necessary condition of blast furnace working, the non-productiou of liquid zinc by the method of direct reduction is sufficiently explained. If, however, the reduction is effected in an atmosphere containing a minimum of carbonic acid, and the gases when cooled to 60° Cent. are passed through a centrifugal machine, the zinc contained may be collected as dust containing from 72 to 90 per cent of metallic zinc, silver, lead and copper in the ore being also volatilized as sulphides, but iron remains in the furnace. The author considers, therefore, that the ordinary process of zinc smelting might be modified as follows:

1. The ore, whether calamine or blende, must be carefully roasted to convert it as nearly as possible into oxide.
2. The zinc oxide mixed with three times its weight in bituminous coal and 5 per cent of lime is coked, giving a material with 22.7 per cent zinc, partly in metallic form.
3. The zinc coke is burned by hot blast in a closed top furnace, with a flue at the top connected with a centrifugal machine. The zinc volatilized and carried off by the gases is collected in the flues and the drum of the centrifugal machine. The gases when cleaned are utilized as fuel.
4. The zinc dust is subjected to a pressure of about 1500 pounds per square inch, which reduces it to about 10 per cent of its original bulk, making it perfectly compact.
5. The compressed zinc dust is distilled in retorts without the addition of carbon, when about two-thirds of its weight of metallic zinc of great purity is obtained. Lead and silver if present remain in the fixed residue. This operation requires much less fuel for heating than the ordinary method of reducing, as the material in the retort, being practically metallic zinc, is a good conductor of heat when compared with the mixture of zinc oxide and carbon, which is a very bad one.

Probably a more complete reduction might be obtained electrolytically, as a lower tension current would be required than for the reduction of salts, the material being already in the metallic state to a great extent.—Engineering and Mining Journal.

THERE is a somewhat vague rumor afloat to the effect that all the lightships round the coasts of the British Isles will before long be connected telephonically with the shore, and that a system will be arranged by which a fishing boat, a trawler, or a merchantman's boat can make connection to a "wire" attached to a buoy, and send news ashore. Such an arrangement would have many advantages, particularly in time of war, when a cordon of telephones round the coast would be a most important addition to defensive armament.

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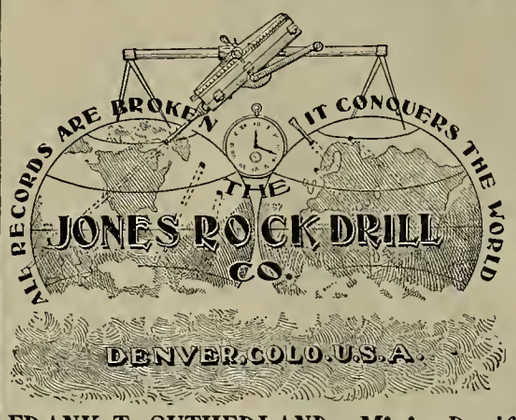

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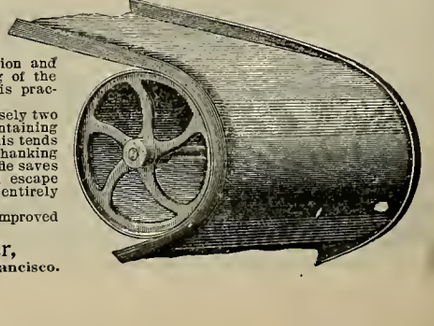

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Mechanical Progress.

Chilling Test Pieces With Liquid Carbonic Acid.

Writing on the use of liquid carbonic acid gas for chilling test pieces, especially stone, iron and steel at low temperatures, M. Ph. v. Haller, in the *Industrie Zeitung* of Riga, says that a cheap and simple form of apparatus in which the test specimens could be cooled would consist of a wooden box with double walls, top and bottom, the spaces between being filled with some non-conducting substance. The liquid gas could be led into such a box from the iron or steel flasks in which it is furnished, and would be deposited in great part in the form of frost at a temperature of about seventy-eight degrees Centigrade. The test specimens could be readily put into and taken from such a box, and would quickly get a low temperature. One of the Russian railroad companies is on the point of having such an apparatus constructed for testing rails and wheel tires at low temperatures. The possibility of accomplishing the desired object with such an outfit, viz., the rapid freezing of specimens, was demonstrated by putting a number of iron test pieces into a bag of several thicknesses of coarse cloth and then introducing the liquid gas. This at once became solid and filled all the spaces between the specimens which thus lay packed in snow. Each specimen was provided with a depression into which mercury could be poured, and on doing this, after a short exposure in the freezing bag, it was found that the mercury immediately solidified, showing, in the absence of a suitable thermometer, that the temperature of the specimens was certainly below thirty-nine degrees C., if not lower. At the St. Petersburg Laboratory of Experimental Medicine a cold room of quite large proportions has been fitted up in which also liquid carbonic acid is the cooling agent.

Recent Armor Plate Tests.

On the 4th inst., a four-inch Carnegie Harveyized nickle steel armor plate, curved to a radius of nine and a half feet, weighing 6300 pounds, and representing a group of armor of 293 tons for the barbettes of the Brooklyn and Iowa was tested at Indian Head. This plate was peculiar in having a large number of surface cracks, some of which were three-fourths of an inch deep and five-hundredths of an inch wide. Four similarly cracked plates have already been tested, supporting the theory that such cracks, which were caused by bending the plates, do not decrease the resistance. The plate had twenty per cent of its thickness consumed in these cracks and the Carnegies wanted to withdraw it, but finally determined to let it be tested.

The first shot was aimed at an uncracked portion, a four-inch thirty four pound Carpenter shell being used with a powder charge of eight and five-tenths pounds, giving a velocity of 1491 feet a second. The head of the shell perforated the plate, going six inches into the backing, a fragment remaining in the shot hole, while the body rebounded. The next shot had an impact blow—the first one immediately in the center of a group of numerous cracks. A Carpenter shell was used with nine and six-tenths pounds of powder and a velocity of 1595 feet a second. The shell was smashed up, flying into minute fragments, showing that the plate was stronger where cracked than elsewhere.

As an experiment a Carpenter shell with a velocity of 1676 feet a second and a charge of nine and eight-tenths pounds of powder, was then used. The shot struck ten inches from the second impact in a spot comparatively free from cracks and perforated the plate, but broke up.

These tests sustain a theory of armor experts that plates with cracks may be more effectively Harveyized and hardened, and it is thought that this discovery, if verified beyond doubt, may be utilized in future armor making.

On the 6th inst. an armor plate made by the Bethlehem Company was tested with satisfactory results. The plate tested was one of a group of Harveyized side armor for the battleship Texas. Three hundred tons were accepted. The plate shot at was eighteen feet two inches by six feet four inches and twelve inches thick, tapering to six inches. An eight-inch gun was used, with Holtzer projectiles weighing 250 pounds. In the first discharge seventy-nine and a half pounds of powder were used, and the projectile attained a speed 1678 feet a second. It was aimed at a point six feet and six inches from the side of the plate, and thirty-four inches from the top. It struck the mark fairly and was shattered, the point remaining imbedded in the plate. It was estimated that the penetration was about six inches. Not a crack of any kind was to be seen, and the shot seem to have no effect whatever upon its target.—American Manufacturer.

Fire-Resisting Glass.

An interesting test of fire-resisting materials and construction, says an exchange, was recently carried out in Berlin, under the auspices of the fire brigade and insurance companies of the city. The idea of the tests was moted as far back as 1889, but there was considerable difficulty in arranging for a series of "fires," which were intended to be as "natural" as possible, and yet should not be dangerous. Finally, the municipality gave the experimenters the use of an old warehouse for their purpose, and this building, having been fitted up to represent various types of fire-resisting structures, was duly set on fire. Care was taken to subject the exhibits to the temperatures, irregularities of heating, suddeu shocks by falling weights or jets of water, etc., which generally occur at conflagrations, and it was found possible to take fairly exact observatious. Among the most satisfactory results obtained were with the fire-resisting glass made by Messrs. Siemens of Dresden. The assessors declare it to be the most suitable for any skylight or window necessary in a division between separate risks, as it will resist a temperature of 1300° C. (2372° F.) for half an hour aud more, bearing all manner of shocks and strains without suffering appreciable damage. Care is required in fixing this glass, however, as the iron frames generally used for the purpose buckle under heat, and show, between the iron and glass, openings through which flame can pass. Some of the so-called fireproof floors made of iron girders and concrete came to speedy grief in these tests; while iron and brick floors stood very well, as did the "Monier" construction. As regards fireproof doors, nothing stood better than double oak covered with thin sheet iron, between which and the wood there should be a layer of asbestos cloth. Seeing how many warehouse fires are propagated through windows, the assessors attach great importance to their demonstration of the capability of Siemens glass for withstanding flame.

A Fuel Oil Test.

The fuel oil test on the tug Black Ball recently was a success. It was demonstrated to the satisfaction of all who witnessed the severe trial, that oil is practical, ecouomical and also smokeless. During the ten hours that the tug was in service, with its eugine working almost continually under a full head of steam, the smokestack emitted scarcely a hatful of smoke and the steam was kept at the "blowing-off point" every minute. There were plenty of skeptical witnesses present to see the test, but all were forced to admit that the demonstratiou was a surprise to them and no severe criticisms were made. Every effort was put forth to give the boat the most severe test possible by making her tow twice as heavy a load as ever before. Three of the largest mudscows on the river were taken from the north end of the drainage canal at Robey street, down the river and out into the lake beyond the two-mile crib, where they were dumped and towed back up the river empty. The trip was made in three hours and ten minutes. Owners of other tugs said before the trial that if the boat could tow one loaded scow to the mouth of the river in four hours, they would be satisfied and would admit the trial a success. The tug could not have made the trip at all with coal for fuel, but with oil she had steam to spare on her return.—Marine Record.

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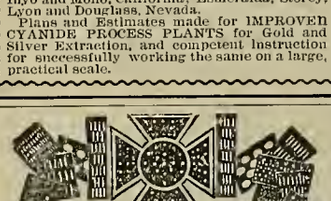
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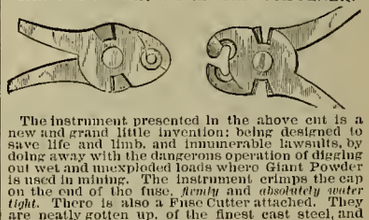
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

EXTENSION OF PLYMOUTH.— *Ledger:* The Extension Mining Company has extended its financial interests to Paris, whose $500,000 has been added to the company's capital. It is proposed to continue prospecting until such time as there is either a bonanza secured or a certainty exists that the ledges they are now working on do not increase in value with depth.

THE HENDY OF NASHVILLE.—The same people who are prospecting the Lucille have purchased the Hendy mine in El Dorado county and placed D. O. Wickman in charge. It, like their other properties they are handling, is to be thoroughly prospected.

THE RICHMOND OF ENTERPRISE.—The Lucille capitalists have bought the Richmond, an early-day property, and purchased a mill, which they will erect thereon in order to make a thorough test of the ore. Judge Kroning has been placed in charge of the property, and has given several of Plymouth's young men work there.

AT THE GOVER OF DRYTOWN.—At the Gover mine it begins to look like old times again. Four hundred cords of wood have been ordered and several teams are now engaged in hauling. Poles, lagging, timbers, etc., are also coming in. The new electric pump will soon be ready to start. Four electricians are busily engaged in placing it in position.

BLACK HILLS, SEATON AND POTOSI OF DRYTOWN.—It is rumored that some mining men have been making a tour of inspection through the tunnels and works of Black Hills and Seaton, also of Potosi. We expect to see some of these claims in operation again before many months.

Mr. Robertson, who has had charge of the Oneida for many years, has commenced to clean out an old shaft near the cemetery in Plymouth. The shaft was down eighty feet on the ledge, and he intends to prospect it thoroughly to a reasonable depth.

Calaveras.

BIRNEY MINE.—Angels *Echo:* Twenty-five men are now at work in the Birney mine, near Angels, and the mill, which has been in course of construction for several weeks, is nearly completed. The mill will have a capacity of ten stamps, but only five will be put in at present.

Nevada.

WASHINGTON DISTRICT.—Nevada City *Herald:* The Chinese company which has leased the Omega mine and bed of Scotchman's creek, is about to erect a dam at the latter place, to restrain the debris from the mine at Omega. They will also reconstruct the Scotchman's creek ditch. Towle Bros.' teams have been busy for the past two weeks hauling in lumber for the work. It is to be regretted that white men did not obtain the lease, for in that case it would have been of great benefit to the community. The Omega mine has a good reputation as a gold producer.

In running the tunnel at the Giant King mine some very hard rock has been encountered, which makes progress very slow. A number of large stringers containing gold-bearing quartz have been cut through, some of them being as large as an ordinary ledge in other places; but the main ledge, which is an immense one, has not yet been struck. From the latest calculations it is expected that the wall will be reached at 436 feet. The tunnel is now in about 420 feet.

The Rocky Bar Gravel Mining Company is making preparations to sluice off the shallow ground. Old residents in this section say that when the adjoining ground was worked it yielded very good returns, and the company that operated there worked up to the limit of their claim. It is to be hoped that the present company will be successful, as they have spent a great deal of money in the enterprise.

The Mountain View Mining Company is pushing its tunnel ahead as rapidly as possible. The tunnel is being run to tap the ledge and is now in about 125 feet. It is expected that seventy-five feet more will bring them to the footwall.

The work of repairing the Bloomfield, Lake, Milton and others of the large ditches, has been going on for the past week or two, and in consequence the mills obtaining power therefrom have been shut down. The work is nearly completed, however, and they will then resume.

The Rainbow mine, in God's Country, of which Mr. C. J. Garland is superintendent, continues to look as favorable as ever, and quite a force of men is at work. The mill at this mine is one of those that obtain power from the Bloomfield ditch, and is of course closed down at present, but the superintendent says he expects that they will have it running in a few days.

The miners from the Culbertson mine report that everything is lovely there and the mine is doing well. This mine is under the management of David Moore.

ENGLISH MOUNTAIN MINE.—Truckee *Republican:* Much interest is being centered in the country around the English Mountain mine. Much prospecting is being done and good quartz is being found in the mountains all around that vicinity. Several Truckeeites have located ground around there and there is a good prospect of there being lively times out in that camp next spring. The English Mountain Mining Company are putting up a big quartz mill with a good number of stamps, and have had about 100 men working for some time past. They will start up in full blast next spring. Meadow Lake country has been rich in gold, and in past years has furnished her quota to the gold of the State, and it is not by any means worked out. Mining is reviving in that part, and, from the prospects, it will be sending gold to San Francisco for some time to come. The English Mountain is about eight or ten miles from Webber lake. If present indications go for anything, Truckee will reap much benefit from those mines in the near future. We trust every effort will be used to direct the traffic this way.

SAN JUAN RIDGE.—Grass Valley *Union:* San Juan is picking up considerable. A great deal of prospectiug is being done for quartz.

The Boss mine is looking well. They have about twenty-three men employed.

Crane & Wright are pushing their tunnel ahead with good prospects.

The Huckins Bros., who own the extension of the Boss mine on the north end of the river, are pushing their tunnel ahead from the river side, and also have their house about completed on Yuba ravine.

The McCullough Bros., who have leased the Junction mine from the Huckins Bros., have their mill about completed, and will be ready to run in a few days.

DAISY HILL MINE.—Grass Valley *Telegraph:* We are very pleased to state that a fine ledge of rock has just been struck in the Daisy Hill mine. The ledge, which is twenty-six inches wide, is north of the shaft about four feet; it shows free gold all through and prospects very high. Some of the experts that have seen it claim that it is the best prospect seen in Grass Valley in many years. The amount of work done at this mine since Messrs. Kingsley and Taylor took hold of it, is simply astonishing—a hoisting and pumping plant, buildings, a shaft close to 250 feet in depth, and all done in about four months. The latest improvement is an electric plant for lighting purposes, and the miners drill in the mine by electric light.

A PLEASANT RIDGE MINE. — Nevada City *Herald:* The Live Oak Consolidated Mining Company has levied assessment No. 5 of ten cents per share. The money thus raised is being used to develop the mine, which bids fair to become a valuable property. The Live Oak Con. is situated down on Pleasant Ridge, and though there are no other quartz mines near, this mine has a well doveloped ledge that assays well and has stood some thorough mill tests. The company has prospected all along their ledge, which is a flat one and lies near the surface, and found good ore wherever they sunk. The ledge runs right along the top of a ridge, where no water could be had, and the mine was dry, too. Steam power was used, but they could not get enough water for the engine and mill, so a ditch several miles long was run, and has just been completed. Now the mine is running again, and no further trouble is anticipated. Richard Stager of Grass Valley is superintendent. The Live Oak Con. is owned by several well-to-do business men of Sacramento, chiefly Germans. They are a plucky company and spend money without stint.

PAYS WELL. — *Transcript:* William R. Thomas & Co., lessees of the Morgan & Tilley ledge on Mosquito creek, have just received returns from a lot of quartz sent to the Selby Smelting Works. The net yield to them is $25 per ton. The rock came from the bottom of the shaft, where the ledge is about two feet wide. A crosscut is being run and will tap the ledge in about twenty feet more. In the Niagara ledge, which is situated a few hundred feet distant, the same kind of rock is found, and the results met with in the Morgan & Tilley have caused the owners of the Niagara to begin to make arrangements for working their mine.

Placer.

HASKELL. — Placer *Republican:* Developments in the Haskell mine are looking better all the time, and the owners are satisfied of some very rich yields in the near future. This property is a gravel mine situated on the Gaylord place, a short distance southwest of this city. The mine was incorporated last June with a capital stock of $100,000, and has been one of the most thrifty pieces of mining property in this section.

A. O. Bell is preparing to erect a five-stamp mill on his quartz mine near Emigrant Gap. Mr. Bell is probably the most successful prospector in this section, and he feels confident that his present claim will be as rich as his former ones have been. The rock will average from $25 to $30 per ton.

Plumas.

LA PORTE MINING ITEMS.—*National-Bulletin:* Six New York capitalists, a few days ago, were up to look at a large mining property at Cleghorn's Bar, owned by McClellan & Post. They spent nearly a week in examining the property, then returned to San Francisco. Their engineer remained to complete a survey, which he did and departed Tuesday. It is very probable that a sale of the mine will be effected and operations commenced.

The difficulties which have prevented the working of the Slate Creek mine are to be adjusted. An agent of the company came up to La Porte on Monday. He said he came to pay up the indebtedness, to the end that operations might be resumed. This will be good news to the people of that section. This is an extensive and valuable property.

The Thistle Shaft is reported to be doing better than ever before. They have just struck into the main channel and the gravel is said to be rich. The company employs seventy men, not including those on contract work. Five new dwellings are going up at the mine. This mine has fully demonstrated the great wealth which lies hidden in the ancient channel in the ridge extending from Gibsonville down to La Porte.

Above and adjoining the Thistle Shaft ground is that owned by Horace Taher. He has a tunnel far into the mountain and thinks he is within a few feet of the channel. Lack of funds has caused him to suspend work temporarily. Here is one of the best opportunities for capital to be found in this part of the State.

It is probable that the Iowa Consolidated placer mine, owned by Mr. Brabhan, will be opened up not later than spring. Mr. Brabban is making arrangements with that object in view.

Meikle & Wolters have the Hepsidam mine leased and are working it with reasonably good success. They employ about twenty men.

The Excelsior mine, owned by Hendell and others, is working a small force of men.

The Pioneer drift mine at Grass Flat has a large force of men employed. This property is owned by Diesen & Cowdery and is yielding handsomely.

MINING SALE.—Plumas *National-Bulletin:* Last evening Messrs. P. A. Wagner, H. A. Swift and Joe Peppin came down from Granite Basin. Messrs. Wagner, Swift and others have purchased of Peppin the Christie quartz mine and taken a bond on the Golden Carrier.

Mr. Wagner is the manager of the Judson Works, and is very wealthy. It is the intention of the new owners to erect a new quartz mill as soon as possible, and for that purpose have already ordered the machinery, lumber, etc. Quite a number of men will be put to work immediately.

San Diego.

PROSPEROUS GOLDEN CROSS.—Yuma *Journal:* The last cleanup at the mill was the largest yet made. It is not known how much it was, as the company has no information to give out. Four guards took the bullion to the station.

Dubravich, Johnson and McGlone are still working their mines, and they are showing better. McMahan, Lawrence and Ralham are working another claim, and they have good ore in sight. The stage to Ogilby now runs with four mules to handle the business.

Shasta.

A BONANZA MINE.—Redding *Free Press:* R. G. Hart of the Texas Consolidated mine presents some figures that astonish us relative to the mine. They are taking out ore from the fifth level—a depth of 910 feet. Their tunnel is in 1700 feet, and they have an exceedingly rich pay chute 160 feet long with a ledge varying in thickness from twelve to fourteen feet. During the last five weeks, from ore shipments, they made a total net return of $22,197.82, as follows: First week, $4606.83; second week, $4739.87; third week, $3650.32; fourth week, $3723.65; fifth week, $5277.10. During the last three months the mine has produced $60,000.

On the river the Diestlehorst dredger has struck a rich bar just above Middle creek and is scooping up the yellow gold day and night.

W. P. Miller's model ten-stamp mill runs ten hours a day. Electricity will soon be introduced in connection with cyanide to work slums and concentrates.

On what is known as Pigeon Ridge, Messrs. Lockhart and McCormick are doing development work on two twenty-five foot ledges.

In the Watson Gulch district several ditches are being put in order for the winter.

At Arbuckle six men are getting ditches ready for the winter rains. Some Red Bluff people are proprietors of a gravel bank at Round Boulder creek.

At Sunny Hill, W. H. Smith is running a drift west from the 200-foot level to cut a parallel vein which shows on the surface.

At Ono some cement claims are being drained and prepared for work when water comes.

On the south fork of Clear creek E. L. Ballou reports working twenty tons of ore for the Kingsbury Bros. that went $50 to the ton.

At Muletown, Jones & Christensen keep their mill going on their own ore.

The Chinamen on Clear creek, just below Igo, continue taking out gold by the quart. John has got a piece of virgin ground and is making a scoop.

Boswell & Bro. have ten tons of ore sorted and ready to ship. This is from their Muletown claim, where the ore averages $190 to the ton, and is on land claimed by certain settlers as agricultural in character.

Senator John P. Jones contemplates doing hydraulic work on his Clear creek gravel mines the coming winter.

Considerable work is being done on claims in the vicinity of Nigger Hill. Some are showing fine ore dumps.

Two Montana men are negotiating for property near the county hospital building. The ore assays up in the hundreds.

The starting of the mill at Iron mountain makes things look like old times.

James Salee has forty feet of drifts run on the 100-foot level on the old Spanish mine at Upper Springs, with four feet of $20 free-milling ore. Timbers are being sawed out for the ten-stamp mill.

The Ellery boys are exposing some fine ore in their prospect.

Jack Conant's mill on the Wheeler or American mine is being rushed along. Jack says his ten stamps will be dropping on November 10th.

The Uncle Sam mine on Squaw creek has been working some very high-grade ore of late.

A new deal is pending on the Snyder mine, so it is reported.

The Balla Klalala mine at Windy camp has not been sold as reported. Several suits over commissions are on the tapis. Matters may be patched up, however.

Col. Lyons, manager of the Rich Gulch Co. at Old Diggings, returned this week from St. Louis, and will renew work on the company's property.

At Copper City the placer miners are making good wages. Popejoy and Zinn both make good clean-ups.

The Walker mine has completed 1200 feet of tunnel and made an upraise forty-two feet to connect with the old workings. They cut twenty-four feet of high-grade gold ore. None of it runs less than $25 in gold.

Mr. Anthony, superintendent of the Central mine, received orders to push the tunnels and show up the ore bodies before spring. Roasting furnaces and barrel chloriuation will be put in their mill, and the Central will roll out the yellow bricks once more.

The strike in the Texas Consolidated will set the ball rolling. Ed Reid will commence working his mine next week. The ore from this mine runs up in the hundreds, but an excess of water has been the harrier to successful working.

At Quartz Hill, Maryanski reports finding a body of high-grade gold ore. It is supposed to extend from the surface workings to the 100-foot crosscut tunnel. Tom Harrison is having some trouble in getting his final payments for the property.

At the T-Shasta Bar tunnel above Elmore, where Charley Morton has the river drained, he reports making $4 per day to the man.

Sierra.

THE ALASKA MINE.—*Mt. Messenger:* We understand that the Alaska mine, near Pike City, has been sold to a San Francisco company. It has been found absolutely necessary to sink a new shaft on a ledge parallel to the one on which they are now working, and the old company had not the capital to go ahead on. On a report of the mine by G. H. O. Sunderhaus, the new company bought the ground and will immediately commence operations. They will put in an electric plant from the Middle Yuba river and run all their machinery by electricity, thus doing away with the costly steam now employed. The company estimate that it will take over $50,000 to properly open up and develop the mine. W. W. Casserly will still remain in charge of the property. This is known to be a good piece of property, and will pay well if intelligently worked.

Siskiyou.

QUARTZ AND GRAVEL.—Yreka *Journal:* The Schroeder quartz mine at Deadwood is yielding good returns, and the mill is kept in steady operation day and night. A large force of men is at work in the tunnels stoping quartz, so that there will be no cessation in crushing until the winter storms interfere in the way of deep snow on the mountain.

Austin & Co., of the Grenhorn blue gravel mine, have struck very rich looking blue gravel at the new shaft recently sunk near the original prospecting shaft, but owing to scarcity of water the gravel is wheeled out on cars to await the rainy season period, commencing in December.

The Empire quartz mill, at Empire creek, Klamath river, near Honolulu, is now kept in steady operation under the supervision of the Hogler boys, with an abundance of quartz on hand and a large ledge to continually maintain the supply. The men in charge say the quartz now going through the mill will yield about $15 a ton, and we earnestly hope their belief may prove true, as the enterprising owner, Chas. Junker of Yreka, has sunk an immense sum of money in developing this mine, which gives every encouragement of eventually becoming very valuable mining property.

Trinity.

AT BULLYCHOOP.—Trinity *Journal:* W. J. Grigsby was in from Bullychoop and reports the prospects of that camp as very favorable. He has a lease on the Bullychoop mine and is putting in steam power to run a five-stamp mill and the two arrastras now on the ground. He will be ready to run as soon as two castings, expected daily, arrive. He is working twelve men, and will work right through the winter. The ledge is strong and is looking well. Mr. Grigsby has a new method of treating rebellious ores which is very successful and does away with the necessity of shipping them away. There is a good deal of work being done at the camp this fall and its future is very promising.

Tuolumne.

THE RAPPAHANNOCK MINE.—Sonora *Democrat:* This celebrated lode is now under process of vigorous development by our esteemed townsman Richard Chute. The lode was very rich in free gold and sulphurets twenty years ago, but until Mr. Chute acquired title thereto nothing had been done since. The old shaft had been sunk to a depth of 112 feet, and at a short distance above the bottom the chute pitched out of the shaft and was lost. In the old shaft the lode vein matter and all the quartz matrix gave fine results and much was anticipated, but the losing of the vein terminated operations. Subsequently Mr. Chute came into ownership of the property, and he with characteristic energy immediately erected fine, substantial hoisting works, and now has a shaft down seventy feet, which is intended to tap the old shaft and open up the lode at the point where it was lost. The quartz and the entire vein matter in the new shaft prospect well in free gold, and carry about three per cent of sulphurets which assay high in gold. From the known and established richness of this claim, and from the fact of its being the immediate continuance of the Rawhide mine, a great future is reasonably expected from its operation. The hoisting works have all the necessary modern equipments, and its large, splendid engine is calculated to sink the shaft to a depth of 1000 feet. At present twelve men are employed at the mine and work is carried steadily along. Recently Mr. Chute removed thither the Lamphear stamp mill from Confidence, and in due course of time it will be in operation.

NOTES FROM BIG OAK FLAT AND GROVELAND.—Mining matters have been looking up a little this summer in these localities. Mr. Albert Mack has a shaft down some fifty feet on the Perrin mine (now Mr. Mack's property). This was a paying mine in old times.

Mr. C. L. Mast has a shaft down some distance on the Mississippi at B. O. Flat, and has put up steam hoisting works. The work is temporarily suspended, but will be resumed shortly.

Messrs. Lowe and Maguire of San Francisco bought the Stanley and Bean mine near Groveland, and are now engaged in develop-

ing the same. They have a strong vein and some very rich ore. They have a large quantity of quartz out to be crushed as soon as there is water to run the Big Creek mill.

Mr. L. Cassaretto has leased his mine, the Kamika, situated N. E. of Groveland, to some San Francisco capitalists, with privilege of buying. They intend to add five stamps to the mill and run by steam power when there is not enough water.

The Belcher at Deer Flat is idle for the present, but Mr. Hill, the energetic superintendent, expects to start up again soon.

A few of the boys have done quite well this summer at pocket mining.

AN OLD DUMP.—Tuolumne *Independent:* Billy Johns, or "Commodore Johns" as he is generally termed, working at the Keltz, went prospecting on the dump of the old Continental mine, one mile above the Riverside, where he picked up rich specimens of ore. This dump was ore taken out of the mine 30 years ago, and abandoned. He supposed it was a piece some one had dropped there; but, prospecting through the dump, he found several pieces showing gold freely. He estimates of the 100 tons there, 60 or 70 tons will pay $15 per ton. He then investigated the old shaft, the timbers of which had been partially burned out, and dug pieces out of the vein which, he said, gave the best prospects he had ever found. The vein crosses the river and can be tunneled into from either side. This may prove to be another valuable discovery.

A Sacramento company have relocated the old Deacon claim on Saw Mill Flat, which in the early sixties was owned by the Graham brothers. This old mine was valuable and has yielded many a fortune.

Wm. Sharwood went below Monday to get a steam pump to relieve the Carlotta mine of an overdose of water, prior to an inspection by several San Francisco capitalists, who will there find a good and safe investment.

It is rumored that Messrs. Leachman and Sharwood have leased the Symous mine and will begin operations at once.

NEVADA.

Washoe District.

SAVAGE.—Virginia *Enterprise:* On the 1100 level in the north lateral drift, started from the east drift, they continue to extract ore on the sill floor upward to the sixth floor. The south drift started from the east drift was advanced ten feet; total length sixty-one feet. Face in quartz and porphyry. During the week we have hoisted twenty-eight cars of ore. Car samples average $24 per ton. On the 1050 level the south drift started from the east drift thirty feet from the south ore stopes they are stoping out fair-grade ore. At a point eighty feet north of the south boundary they have started a west crosscut, and advanced the same eleven feet; face in quartz and porphyry. On the 1100 level, fifty feet back of the face of the north lateral drift, they have started east and west crosscuts, and advanced the same sixteen and fourteen feet respectively in quartz and porphyry. They are uptaising in the ore on the west side of the north lateral drift. The east drift from the new station at the 950 level was advanced twenty-two feet; total length forty-seven feet; face in quartz and porphyry.

CHOLLAR.—The winze from the north crosscut, 450 level, started last week, is now down thirteen feet; the bottom shows a width of seven feet of ore of good grade, face samples running from $25 to $60 per ton.

We are opening the old stopes on this level, from which we are getting spots of good ore in place and fillings of fair grade.

On the 555 level the main north drift has been cleaned out and retimbered fifty-five feet for the week.

From the openings on the 450 level we have saved and shipped to the Nevada mill for reduction 521 tons and 1800 pounds of ore, the average battery samples of which was $37.95.

POTOSI.—Crosscut No. 5, started from the south drift, 450 level, was extended twenty-one feet; total length one hundred and two feet. Face in clay and porphyry.

The winze from the 450 level, 200 feet south of the north line, is down twelve feet and the bottom shows a width of two feet six inches of ore, giving assays from $25 to $50 per ton. From this winze we have saved 31 tons and 900 pounds of ore, which has been sent to the Nevada mill for reduction.

At the croppings we have stopped the northwest drift and resumed sinking the shaft.

S. N., M. & U. SHAFT.—The east crosscut from the north lateral drift, 450 feet north of the west drift, 1520 feet west of the shaft, 900 level, has been advanced during the week eighteen feet; total length, 138 feet; face in quartz, clay and porphyry.

The west crosscut from the Union Con. south lateral drift from the west, 1520 feet west of the shaft, 900 level, has been extended twenty-five feet during the week; total length, 147 feet; face in clay and porphyry.

CROWN POINT.—The west crosscut from the south drift on the 500 level is in porphyry. The north drift on the 650 level is in the same character of material as reported last week. The east crosscut on the 800 level is in vein material composed principally of porphyry. There were extracted from openings on the 600 and 700 levels during the past week, 632¼ tons of ore which has been shipped to the Mexican mill for reduction, the average battery samples of which was $9.22, of which $8.17 was gold.

BULLION.—The west drift from the Ward shaft, 820 level, has been extended fifteen feet during the week; total length 1147 feet; face in soft porphyry and clay with a strong flow of water.

UNION SHAFT.—East crosscut from the north lateral drift, 450 feet north of west drift, 1520 feet west of shaft, 900 level, has been advanced during the week eighteen feet; total length 138 feet; face in quartz, clay and porphyry. The west crosscut from Union Con. south lateral drift from west drift, 1520 feet west of shaft, has been extended twenty-five feet during the week; total length, 147 feet; face in clay and porphyry.

SIERRA NEVADA.—The northwest drift at a point 160 feet west of the mouth of the Layton tunnel, is out eighty-seven feet; advanced thirty-two feet during the week; face in porphyry and quartz.

The east crosscut No. 1 from north lateral drift No. 2, at a point 140 feet north of intermediate tunnel, is out fifty-two feet; advanced twenty-two feet during the week; face in quartz and porphyry.

BELCHER.—The east crosscut on the 400 level has been cleaned out and repaired thirteen feet during the week. The same work is going on at the 1000 level in the main north drift and west crosscut. Also in the east crosscut on the 1000 level. Twenty tons of ore were hoisted during the past week.

SILVER HILL.—The south drift from the winze, forty-five feet below the fifty level and 260 feet southwest of shaft, has been advanced during the week fifteen feet; total distance from the winze twenty feet; the face shows two feet of milling gold ore of fair grade.

WARD COMBINATION SHAFT.—The west drift from Ward shaft, 820 level, was advanced fifteen feet during the week; total length, 1147 feet; face in soft porphyry with a strong flow of water.

ALPHA.—During the past week have cleaned out and retimbered fifteen feet of the shaft below the 382 level; total depth of shaft cleaned out and retimbered, 417 feet.

ARIZONA.

THE DIAMOND JOE MINE.—Mohave County *Miner:* We understand that the Diamond Joe mine of Cedar district has been bonded to Mohave county parties, and that the probability is the property will change hands in a short time. This mine has been a steady producer of rich ore for several years past, although worked in a crude manner. The sales from ore have netted fully $70,000, at the low price of silver. So far the main shaft on the property has been carried down 240 feet, and at the bottom, ore far richer than that found on the surface has been found. A tunnel 400 feet in length taps the shaft near the 150-foot level. Last summer a new shaft was sunk to a depth of fifty feet, and a cave in the hanging wall revealed a large body of rich ore in a parallel ledge unknown before that time to the owner. This body of ore has been worked on ever since its discovery. At no time since its discovery has the mine failed to pay its way, and if it had been worked in a systematic manner, it would have become the producer of large dividends. We hope the sale will go through, as it will aid in developing that rich section of Mohave county.

OREGON.

NEW CLAIMS.—Jacksonville *Times:* Quite a number of mining claims have recently been located at the head of the Chetco, in Curry county, by a company of Kerbyville miners, who are supposed to represent San Francisco parties.

A twenty-stamp Tremaine mill has been erected at the Copper Stein mine, in Mount Reuben district, and will soon be grinding. A tunnel taps the vein at a depth of fifty feet and the rock is thought to be rich.

The Ashland Company, for whom R. M. Garrett has been prospecting on Williams creek, has suspended operations, some of the members having failed to produce the sinews of war necessary to carry on the work.

Work on the Clay Dollarhide coal mine, near Pilot Rock, is being prosecuted by parties who are interested with Mr. D. in the claims. These deposits and the Tolman discovery, northeast of Medford, if they prove what is expected of them, will open a new industry in this section.

A late cleanup at the Bohemia mines, after a run of less than thirty days, resulted in $7000 worth of gold dust. The mill has shut down to do certain development work. Active work has been resumed by the owners of the Annie mine, the sale of the property reported a short time ago having failed to materialize.

FROM CORNUCOPIA. — Bedrock *Democrat:* Messrs. Wolters and Peters, of Louisville, Ky., who have been looking after their mining interests at Cornucopia for the past two months, informed the *Democrat* that the mines of that district are making a great showing and predicts a bright future for the camp.

The Red Jacket twenty-stamp mill will be moved in the spring from its present site, a short distance above the town, to the mine, which move will do away with the heavy expense of running the tramway, it being damaged every winter by snow slides and necessitating the closing down of the entire plant. These gentlemen are heavy stockholders in the Oregon Gold Mining Company, the owners of the Red Jacket, which is now in litigation, and they confidently expect the matter to be settled in the courts in the courts in the course of a few months, when active operations will be commenced and the property worked on a larger scale.

MONTANA.

THE MAMMOTH MILL.—*New Northwest:* Superintendent Simpson of the Mammoth was over from Sunset on Wednesday. He reports the work preliminary to putting in the new stamp mill as progressing favorably. A road is now building from the divide near the mine six miles to connect with the Camas road and Bonner. At the latter place battery and other heavy timbers essential to the structure are now being gotten out, and the shipment of the plant from Butte to that point will be made directly the six miles of new road is finished. Mr. Simpson anticipates the mill will be up and running within sixty days at the furthest.

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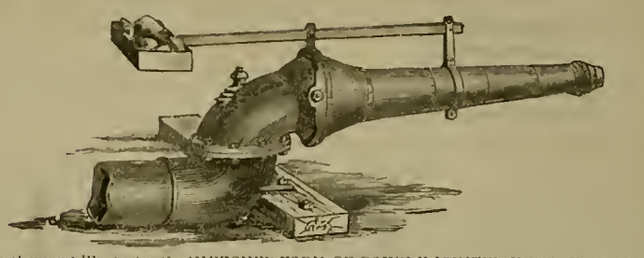

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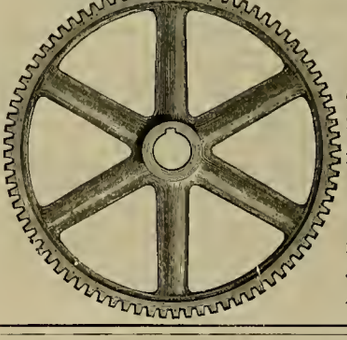

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Electrical Progress.

Electric Lighting of Railway Carriages.

According to the experience of the Allgemeine Elektricitats-Gesellsshaft of Berlin, the simplest solntion of the problem of the electric illumiuation of passenger carriages on railways is to be fonnd iu accumulators pure and simple. We give in the following lines the main features of a system of train lighting by electricity, as recommended by the Allgemeine Elektricitats-Gesellschaft, chiefly ou the basis of their experience on the Dorsmnnd-Grouau Enschede line. It is one of the Government railways of Prussia, about 60 miles long, leading from the very bnsy Dorsmund district across the sparsely populated and qniet plains of northwest Westphalia, to the little town of Enschede, in the kingdom of the Netherlands, a few miles beyond the frontier. The plant has been rnnning for more than a year. The cells employed are a special type of the accumulators of the "Accumulatoren Fabrik Hagen," expressly made for the Berlin company. A battery capable of feeding five five-candle lamps for forty hours would weigh 467 pounds if discharged at fifteen volts; if 22.5 volts are desired, the weight rises to 516 pounds, if thirty volts, 591 pounds. The capacity should leave a rcserve of abont teu per ceut or more. As a rule, discharge at 22.5 volts requiring twelve cells, will answer best. A battery of this voltage, capable of feeding five sixteen-candle lamps for eight, twelve or sixteen honrs, would weigh 443, 516 and 562 ponnds respectively. If two lamps are desired for each compartment, two batteries with one lamp in each circuit would prevent a total extinction of the light, if the battery should give out. Two eight or ten candle lamps replacing one of the sixteeu-candle lamps just spoken of, wonld require batteries weighing 754 aud 886 pounds respectively, for twelve and sixteen hours' service. The cells are put in cases not too heavy to be managed by one man, and these cases placed under the cars, like the ordinary gas reservoirs.

As regards comparative weights, we are assured that the gas plant for five jets for forty hours would weigh about 1,000 pounds, whilst the equivalent electric plant, with a battery of twelve cells, would not weigh more than 640 pounds. Sometimes the cells are placed under the seats. The connections consist both of contact springs and of flexible cords. The discharged cells are exchanged and recharged in the lighting station. Where this is uot feasible, the charging may be doue on trucks ou some siding or with the cells in position, in which case the train has for hours to remain on that siding. This latter arrangement has not much to recommend it. A hiut given in the pamphlet that the somewhat impoverished cells taken out of a first-class carriage might still do for a third or fourth compartment, would hardly be welcomed in this country. For the Germau railways, the company reckon as minimum illnmination admissible: One lamp of sixteen candles for the first class, one of ten candles for the second aud third classes, and two lamps of six caudles for the fourth class. That would euable the first class traveler to read comfortably on any seat, and those in the second and third classes on four of the ten seats; but two lamps of eight or ten candles wonld be more convenient for the first two classes, and proportionately better light for the other two classes as well. The lamps used on oue line should, as much as possible, be of the same kind. The lamps of higher candle-power being more economical as regards current consumption, a good light can be given. Every battery needs a switch; the switches should be accessible to the gnard only. It has not been found profitable to allow passengers to turn the light on and off as they like, although a good deal of light might occasionally be saved if the passengers were considerate. The company do uot want the passengers to tonch anything but the screens. The statc of the battery is indicated by voltmeters or by Aubert's hour-counters. The latter are very simple, but as they only show for how many hours the battery has been discharging, they can be used only with constant and uninterrupted supply. The leads are put under wood or encased in gas-piping; on the enginc the wires are lead cables placed in gas pipes. Ample space is left everywhere between the two wires of each circuit. When desired, cisteru, boiler, eugine, dynamo, and cells are supplied, or a petroleum motor instead of the steam plant. These motors cannot be gnaranteed free of smell. On lines where trains run backward and forward without being uncoupled, the whole accnmulator plant may well be placed on a special trnck. This system is in use on some of the Danish isles and on the west coast of Sweden. About cost, the pamphlet—besides offeriug estimates—does not say anything beyond stating that the electric lighting of the Dortmund-Enschede liuc does not cause any higher expense than the illnmination by gas would cause, although the plant is neither large nor perfect as regards full utilization of the machinery. On this line the ordiuary officials look after the accumulators.

Effect of Electric Current on Varied Metal Pipe.

The evil effect of electric cnrrent ou snbterranean metal pipe was demonstrated in Chicago last week in a test made by Major C. E. Bliven, chairman of the electric hazards committee of the nnion, before members of the several local board commissions. A piece of iron pipe was buried in a barrel of damp dirt, and snbjected to the action of an electric current for 133 honrs. The test was made by rnnuing one end of a wire into the dirt and another one leading ont of it. The current, taking the iron as offering the least electrical resistance, passed through it for some distance and then jumped to the wire leading out. At the point where the wire left the pipe and passed throngh the earth the effect of the current was shown in the badly pitted iron, which was almost entirely destroyed.

The test was conducted in the laboratory of the electrical bureau of the Chicago Underwriters' Association, 176 Monroe street, and it was done to show the destrnctive effect of a current when passing through iron pipe which is buried and to demonstrate the importance of devisiug means to regulate the current of trolley roads which use the earth as a rcturn circuit. The result obtained showed this necessity. For some timc complaints have been coming in of the destruction of water pipes by return currents of trolley ststems. The curreut passes from the trolley wire down through the trolley aud the motor underneath the car, then into the rail and the earth. The current, in seeking the return route to the station where it was generated, seeks the route offering the least electrical resistance, and this is usually the water pipes running down the street. No harm is done the pipe, except the spot where the current leaves it and passes into the earth. There it corrodes the pipe, causing disintegration, which often results in a big hole which renders the pipe useless and causes the city or the water compauy to put in a new piece of piping. That is soon acted upon in the same way, however, aud the whole trouble comes agaiu. Pieces of iron piping are sent to the electrical bureau from small towns quite often which contaiu a dozen holes varying from oue-quarter to oue inch in diameter, the result of current passing through the points where the holes are located. A stand-pipe for the furnishing of water to an Illinois town was eaten so badly at the base by an electric current that it fell. Complaints are growing in number with the extension of electric street car lines using the earth for a return of current.—American Manufacturer.

In a paper read before the American Institute of Electrical Engineers by W. W. Griscom "On Some Storage Battery Phenomena," the author arrives at the following conclusions: 1. That the chemical reactions in a storage battery cell must be complex in order to acconnt for the curves of electromotive force, temperature and iuternal resistance. 2. That the current and the electromotive force of the compouent plates of a cell, and of each part of each plate, are constantly fluctuating, in spite of the fact that uo source of electricity can compare with a storage battery for steadiness and constancy. 3. That by reducing the normal output of a battery by about thirty or forty per cent the discharge can be mainly confined to one set of chemical reactions, thus prolouging the life of the battery. 4. That the uegative and positive plates are apt to get out of step, therefore the battery should be giveu an occasional overcharge when necessary, but only when necessary to get them in liue again.

It is considered that the electrolytic experiments made last season in connection with the manufacture of beetroot sugar were sufficiently successful to warrant their reuewal this year. Besides the experiments at French factories, some thirty-three German firms tried various electrolytic processes. The preseuce of one part of salt prevents the crystallization of four parts of sngar, and the idea of certain electrolytic processes is that by means of electrolytic osmosis the saline constitnents of the juices may be effectively climinated.

An electrical instrument, known as the "Essick page printer," was recently exhibited at work in Philadelphia. This instrument combines a transmitter in the shape of the keyboard of a typewriter and a receiver which works automatically. Pressnre on a letter on the keyboard reproduces the letter on paper in the receiver, and the operator can transmit a message to auy number of receivers at different points at the same time. The receiver is said to print the message rapidly and distinctly.

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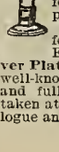
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SAN FRANCISCO.

Practical Information.

THE city water works at Sault Ste. Marie, Mich., will be operated by electricity instead of steam as soon as the change can be made.

THE Minneapolis General Electric Company, Minneapolis, Minn., intend erecting a new power station at an estimated cost of $200,000.

AN important electric project which has been mooted in India contemplates the use of a stream where 3,000,000 cubic feet make a clear drop of 200 feet. Twelve turbines of 1000-horse power each will be used, and a transmission line 110 miles long will be required. The current is to be utilized for power for cotton and other mills, machine shops, pumping, working cranes and elevators, hauling canal boats, street cars, as well as for lighting and other purposes.

ALUMINUM is said to possess the property of leaving a mark on glass or other substances with silicious base, when drawn over them. The marks thus made cannot be removed by friction or washing, and designs can be drawn almost as readily on glass with an aluminum point as on paper with a lead pencil. Magnesium has also the same property, and in an even more marked degree, but being readily oxidizable, the mark soon fades away. Both metals also mark quartz, emeralds and topaz, but do not affect the diamond.

THE extended use of hydraulic lifts is causing increased attention to economy in their working. Formerly, no attempt was made to reduce the expenditure of power with light loads, but now balance cylinders with two sizes of the rams are being employed, the pressure water being admitted to one or both cylinders, according to the weight to be raised. A passenger lift of this kind, lately erected by Mr. Stannah, 20 Southwalk Bridgeroad, London, has given very economical results, which have also been obtained by a lift at Messrs. Hollington's, in Middlesex street, Whitechapel.

IN order to satisfy scientific men as to the real cause of Professor Helmholtz's death, a post mortem examination was made of the body at the desire of his relatives. As a consequence of the paralytic strokes the left portion of the brain was considerably softened, whilst the right portion was perfectly normal and sound. The brain displayed unusually numerous cerebral sinuations, such as are generally observed in the brains of persons of very great intellect. The physicians and pathologists who conducted the examination were extremely interested with what they saw and a cast of the brain was immediately taken.

IT would appear that it is now possible to supply through the national weather service, climatological information for almost every county in the United States. Nearly every county in the country is provided with a station equipped with instruments of the government standards. More than 10,000 crop correspondents are, it appears, at present co-operating with the national weather service through the State organizations; 3000 voluntary observers are furnishing monthly reports of daily observations of temperature and rainfall; and over 11,000 persons assist in the work of distributing the forecasts of the national weather service.

IT is announced that an exhibition of petroleum motors will take place at Berlin next June. The chief points of the programme issued by the special committee of the union of German mechanical engineers are: 1—Those motors only are to be admitted which work with petroleum of at least 0.80 specific weight (which excludes benzine and other motors). 2—The motors will be tried in May, and the exact results will be communicated to the exhibitors and published. 3—The trials will be made as regards power developed, smoothness and ease of working and handling, accessibility, simplicity, and solidity of construction, price, lubrication, safety, etc.

THE new German war balloon is, according to all accounts, a "fearful looking thing." The German, like the French, war balloons have almost double the lifting capacity of the English. Relatively, however, the materials employed at home upon the war balloons are described as both better and lighter and transport is not so burdened by them. At the same time, the greater lifting power of the captive foreign aerostat looks like an advantage, for they can ascend when strong winds are blowing and to higher altitudes, it is said, than the English at Chatham or Alnershot. To facilitate taking observations, the car is hung a great distance below the balloon, sometimes as much as forty feet.

IT is not claimed, says the *Electrical Review*, that the well-known Weymersch battery, with a fluid which costs less than that of Coad, could produce B. T. unit under an average of about 2s. The Velvo-carbon element is still more expensive in its output, and yet it is coolly claimed for the Coad cell that a fifty-candle power lamp can be run for ten hours. It is perfectly well known, adds our contemporary, that electrical energy produced by a dynamo is at least twenty times less costly than the same taken from a battery using zinc as the oxidizable metal. It is also quite certain that light for light, electricity, even from the dynamo, is dearer than gas, yet the Coad secret fluid is said to enable consumers to get their lights of equal power at one-fourth the price of gas!

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Let us book your address to receive this on publication.

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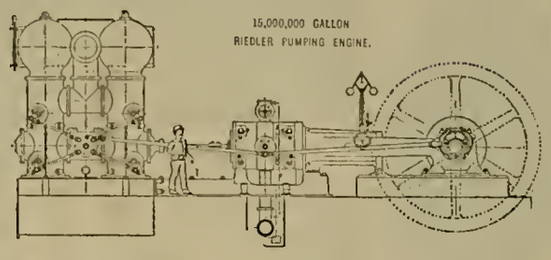

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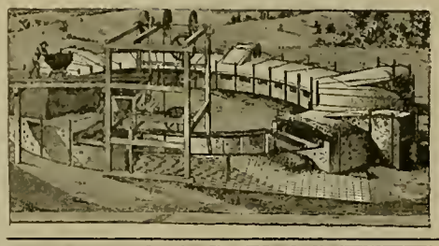

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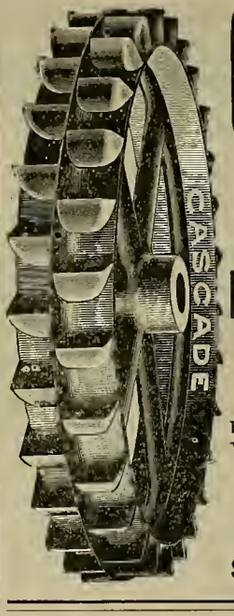

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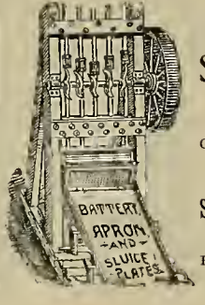

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Market Reports.

The Markets.

New York Prices.

NEW YORK, Oct. 25.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29⅜	63¼	....	....	....
Friday	29	63⅛	9 25	3 15	19 25
Saturday	28 5-16	63	9 30	3 16	.....
Monday	28 5-16	63	....	....	....
Tuesday	....	....	9 40	3 18	19 10
Wednesday	29 1-16	63¼	....	....	.....

The local hullion, mouey and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.86½
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63⅝
Mexican Dollars, nomiual	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	11
BORAX.			
Refiued, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4
Bar	—	@	4¼
Sheet	—	@	5½
Pipe	—	@	4¾
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 55
Drop, B and *larger* sizes, " "			1 75
Buck, Balls and Chilled, do, " "			1 85
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	18
ZINC.			
Sheet	8½@		

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 7 75
Greta	7 50
Nanaimo	6 25
Gilman	5 75
Seattle	7 00
Coos Bay	5 50
Cannel	8 00
Egg, hard	9 50
Wallsend	7 00
Scotch Splint	7 00
Brymbo	7 50
West Hartley	7 75

TO ARRIVE—PER TON.

Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Splint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —

COKE.

English, to load	9 00	@	9 50
" spot, in bnlk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 25, 1894.

FIRST SESSION—9:30 A. M.

100	Alta	23	100		71
50	Andes	58	200	Gould & Curry	63
300		56	300		62
200	Belcher	95	250	Mexican	1 20
100		96	50		1 25
300	Benton	50	100	Justice	25
850	Best & Belcher	1 20	850	Ophir	2 95
300	Bullion	32	150	Potosi	70
200		33	800	Savage	64
100	Caledonia	15	100	Seg Belcher	18
100	Challenge	45	400	Sierra Nevada	87
350	Chollar	66	200	S Hill	03
1050	Con Cal & Va	4 75	500	Union	64
100		4 80	100		65
400	Crown Point	70	500	Yellow Jacket	77

SECOND SESSION—2:30 P. M.

350	Andes	59	200	Mono	20
100	Benton	25	200	Mexican	1 30
300	Belcher	98	150	Ophir	3 10
100	Chollar	72	100	Sierra Nevada	90
100	Confidence	1 25	700	Silver Hill	03
550	Crown Point	74	200	Savage	66
500	C. C. & Va	4 95	200		67
100	G & C.	63	100		68
50		62	400	Utah	05
100	Hale & Norcross	78	300	Yellow Jacket	80
500	Justice	25			

Mining Share Market.

SAN FRANCISCO, Oct. 25, 1894.

The stock market has shown a little firmer toue toward the close of the week than was the case for several days previous. There have, bowever, heen no very important changes iu Comstock prices. On Saturday last a false dispatch was sent concerning a lack of ore helow the 1700 level of the Con. California & Virginia. This attempt to wreck the market is to be investigated by a committee of the S. F. Stock Exchange.

The average battery assay of the Consolidated California & Virginia ore worked at the Morgan mill last week, as officially reported by Mr. Lyman, was $82.32 per ton. This is the highest battery average from any Comstock mine since the old bouanza times.

The annual meeting of the stockholders of the Comstock Tnnnel Compauy was held in New York last week. There were represented 1,340,000 shares. An opposition to Theodore Sutro took the shape of a rival ticket, hut a compromise was effected hy which hoth sides elected some of their men to the Board of Directors. The following hoard was elected: Theodore Sutro, Otto Lowengarde, Elisha Dyer Jr., Julius A. Strugsberg, Maurice L. Muhleman, J. E. Knap and H. H. Smith. The following officers were then elected: President, Theodore Sutro; vice-president, Elisha Dyer Jr., and secretary and treasurer, Maurice L. Muhleman. The treasurer's statement showed that the halance on hand Septemher 1, 1894, was $16,418; the operating expenses during the past year were $36,202, and there was a deficiency of $21,483. Against the deficiency is a surplus fund of ahout $19,000. The honded indehtedness of the company is $1,908,000, the floating indebtedness $6163, and the stated assets $6,481,582.

The following illustrates the changes of the week:

MINES.	18	25
Alpha	$ 13	.....
Alta Consolidated	24	$ 23
Andes	59	59
Belcher	1 05	98
Best & Belcher	1 25	1 20
Bodie	1 25	.....
Bullion	45	33
Challenge	52	45
Chollar	67	72
Confidence	.....	1 25
Consolidated California and Virginia	4 75	4 95
Consolidated New York	.....	.....
Crown Point	77	74
Exchequer	08	.....
Gould & Curry	66	63
Hale & Norcross	87	78
Justice	25	25
Mexican	1 25	1 30
Ophir	2 75	3 10
Overman	23	.....
Potosi	77	70
Savage	64	66
Sierra Nevada	94	90
Union	74	65
Utah	.....	5
Yellow Jacket	87	80

A Balky Horse.

A balky horse is incorrigible under the treatmeut of the ordinary "horseman." In a case reported recently, after all the infallible methods had been tried without success, an ardent admirer of the noble animal and a lifelong student of his peculiarities, in his usual kindly manner, requested the driver to get a stone aud hammer on the bottom of a forefoot. Having hunted a stone he raised the foot of the "incorrigible" and gave it several taps on the iron shoe. "Drive a few more nails," and again the driver hammered the bottom of the hoof with the stone. "That will do; put down the foot and lead away your horse. This crowd has been wasting time long enough." The driver put down the foot, took hold of the bridle, and gave the starting signal. The horse responded willingly, pulling the load up the hill as steadily as if the balking instinct to it was unknown. The crowd cheered and dispersed. "What is the philosophy of that?" asked a delighted spectator. "Mental diversion, and I have never known it to fail," replied the amiable gentleman.—Canadiau Breeder.

Paper-Bound Fly Wheels.

The reinforcement of fly-wheel rims by binding their peripheries with wire is no novelty in Europe, several of these wire-bound wheels being iu use in Englaud. Latterly, however, the suggestion has been made in this country to use wood fly wheels covered with paper. The wooden skeleton of the big wheel is put in a revolving frame, and sheets of manilla paper wouud around it, with applications of glue between. About a hundred layers are wound on, and as the work is not costly, a cheaply made wheel results. Several wooden fly wheels are in use in the Uuited States, but so far as we know uone have yet been paper bound. Where large, light and inexpensive fly wheels are required, the suggestion seems to be worthy of consideration.

THE Honorable Gardiuer G. Hubbard, president of the National Geographical Society of Washington, D. C., is on his way to the Pacific coast for a brief visit. During his stay he will read an original paper before the Geographical Society of the Pacific on Japan aud China. Mr. Hubbard is well known iu Eastern scientific circles, aud was selected to preside at the International Congress of Geographers, held at the World's Fair in Chicago, which was attended by delegates from all parts of Europe. His paper will undoubtedly prove interesting at a time when all Christeudom is watching events in the Orient.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12, Oct 17, Nov 7	J E Jacobns, 309 Montgomery
Belcher M Co, Nev	49	25c	Sept 14, Oct 18, Nov 8	C L Perkins
Golden Eagle M Co, Nev	1	15c	Sept 15, Oct 16, Nov 5	E B Holmes, 309 Montgomery
Ideal Placer M. W & P Co, Cal.	1	10c	Sept 11, Oct 22, Nov 12	E L Mayer, Mills Building
Lady Washing'n Con M Co, Nev.	10	5c	Oct 5, ... Nov 9	J E Jacobus, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3, Nov 8, Dec 3	J W Pew, 310 Pine
North Banner Con T Co, Nev	32	3c	Oct 6, Nov 6, Nov 27	C E Green, Fourth and Townsend
Ophir S M Co, Nev	63	25c	Sept 5, Oct 9, Oct 29	E B Holmes, 309 Montgomery
Silver King M Co, Ariz	12	30c	Sept 4, Oct 15, Nov 12	J W Pew, 310 Pine
Sonth Eureka M Co, Cal	14	1c	Sept 20, ... Oct 29	A Halsey, 320 Montgomery
Starlight M Co, Nevada	3	10c	Oct 10, Nov 19, Dec 10	H R Williar, 321 Piue
Utah Con M Co, Nev	20	5c	Sept 28, Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3	....	Sept 27, ... Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Alpha Con M & M Co	Chas E Elliot, Nevada Block	Oct 30

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 16, 1894.

527,656.—SEPARATOR—J. E. Borchard, New Jerusalem, Cal.

527,659.—BALL BEARING—J. S. Brown, Eureka, Cal.

527,492.—TREE SUPPORT—L. W. Higu, San Jose, Cal.

527,758.—FACE BATH—Harriet H. Hoge, Portland, Or.

527,756.—TRACK CLEARER—Mathews & Doyle, Pendleton, Or.

527,707.—PUMP—M. & J. N. McClay, Phœnix. A. T.

527,620.—STAMP MILL—J. M. McFarland, Colton, Cal.

527,504.—PRACTICE PIANO—W. O. Nisley, Portland, Or.

527,445.—WINDOW PLATFORM—G. W. Ousley, Jr., San Jose, Cal.

527,507.—WASHING MACHINE—C. P. Randolph, Los Angeles, Cal.

527,624.—STEAM BOILER—E. Shydecker, San Jose, Cal.

527,563.—POWDER—E. A. Starke, S. F.

527,636.—DISINTEGRATOR—Frank Walker, S. F.

527,570.—SNAP HOOK—F. & I. F. White, Pomona, Cal.

23,700.—DESIGN—D. C. Wilgus, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ORE CONCENTRATOR.—A. C. Springer, of Seattle, Wash. No. 527,323. Dated Oct. 9, 1894. This concentrator is of the endless traveling belt type, and the invention relates particularly to the construetion of the helt of the concentrator, whereby that type of helt, in which the snrface is divided into a number of parallel runs, is improved. These belts are known as sluiced belts aud the improvements of this patent have for their object the provision of a concentrator in which, by reason of the construction of the helt and of the drums and rollers upon which it is mounted, the helt will travel straight and true, and will be held in position under all circumstances of its operation. These objects are attained by attaching ropes to the belt (which is composed of canvas or other fahric) in sucb a manner that each rope projects from each surface of the helt, forming ribs or ridges both outside aud in, and in having drums and rollers provided with grooves in which these ribs engage to guide the belt.

CHILD'S CARRIAGE.—John W. Jaimison, Vallejo, Cal. No. 526,972. Dated Oct. 2, 1894. The object of this invention is to provide a child's carriage, so constructed that when not in use it may be folded up iuto a compact form for storage and for transportation when it is necessary to travel for some distance before a place is reached where the carriage can be used. It consists of side hars having wheels journaled upon the opposite ends and joints intermediate within the ends, with slides adapted to slip over the joints and be locked thereon; diagonal braces extending between the two side frames; a bed frame consisting of side and end hars jointed together and clasps by which they are attached to springs which support them from the side hars of the wheel frame; a means for supporting a flexible containing sack which, when folded, becomes the hed of the frame; also a pillow and a removable handle, with means for attaching it to the frame. The sack which forms the bed and pillow when the carriage is in use, serves to contain all the parts when they are dismounted for transportation.

RAILWAY JOINT BRIDGE.—Charles C. Wells, San Francisco. No. 526,954. Dated Oct. 2, 1894. The object of this invention is especially to relieve the jar caused by the pounding of the wheels when the cars cross the joints formed hy the meetiug ends of street or other railway rails, and to cause an essentially smooth passage of the wheels over these joints, thus enahling the rails to be placed with the meeting ends at any point desirable, to rest upon the yokes which form the cable tunnels of cable roads or at any point where they may happen to ahut. It consists of a rectangular bridge har, having the upper side made convex, the lower portion of the ends and the lower edges rounded; a single elongated slot in each end; opened, correspondingly shaped channels in the top of each rail end into which the bridge har loosely fits, with its central, convex portion slightly above the surfaces of the rail ends; a bolt passing transversely through a single slot in each rail end, and a corresponding slot in each end of the har so as to form a loosely hinged and movahle joint.

BASIN TRAP.—John Marquis, San Francisco. No. 526,666. Dated Sept. 25, 1894. The object of this invention is to provide an attachment for wash-hasins which combines in itself a trap and overflow attachment, and a jet attachment whereby the basin is discharged through the overflow aud without any other connection with the discharge passage. It consists of an overflow siphon jet discharge having its upper bend above the level of the bottom of the basin, its outer end connected with the outlet below the bottom of the hasin, its inner end connecting with and forming a trap through which and the overflow pipe the contents of the basiu are discharged, and a jet tuhe in the receiving end of the disehage passage adapted to dischargo upwardly by direct impulse upon the water iu the short arm of the passage, whereby this water is set in motiou hy the impulse from below, aud a means for adjusting the jet and regulating its position.

SNAP HOOK.—Frank White and Ira F. White, Pomona, Cal. No. 527,570. Dated Oct. 16, 1894. This hook belongs to that general class of snaps in which the hook head is guarded by means of a spring-controlled sliding bolt seated in the harrel or hody of the device. The hook consists of a blank adapted to be bent iuto shape, having a front portion to form the hook head and nose thereof, a rear portion to form the lugs for the end of the loop, and an iutervening body portion tbe side portions of which are cut out to form au elongated slot in the hack of the body, and having also a recess in its back central portion as an outlet for sand, a slidable holt to be seated in said barrel, having a knob with beveled under portions to project through the slot formed hy the cut outside of the body portiou, and a loop or eye on the rear extremity of the harrel portion.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Messrs. J. S. Gould and F. M. Spencer in the Holloway mine, near Gibsonville, Plumas Co., Cal., and to impound tailings behind log and brush dam in a ravine below the mine; from W. A. Morse in the Mugginsville mine, near Eureka North, Sierra Co., to impound tailings behind a crib dam in Eureka creek; and from John R. Jones in the Wankshaw mine, near Relief Hill, Nevada Co., to impound tailings behind rock dam in Logan canyon, gives notice that a meeting will be held at Room 62, Flood building, San Francisco, Cal., on October 29th, 1894, at 1:30 P. M.

Gold Quartz Mine For Sale.
MILLING PROPOSITION.

No money down. A 20-stamp mill must be erected and mine can be paid for out of product of bullion. The property consists of two claims 1500x600 each. Width of ledge, 1½ foot to 4 feet. Ore runs from $10 to $20 per ton. $75,000 estimated in sight. Two tunnels run in on vein for some distance. Price, $30,000. This is a snap. Owner can he seen in San Francisco.
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Coast Industrial Notes.

—The Santa Maria *Times* predicts that the next industry for that place will be a beet sugar factory.

—The Mount Shasta box factory at Sisson, Shasta Co., was almost totally destroyed by fire on the 17th inst. The loss was $10,000.

Work on the electric plant which is to furnish light for Angels, Calaveras Co., is being vigorously prosecuted. The plant will be established in the canyon two miles above Murphys. This splendid enterprise is the work of the Utica Mining Co.

—The Anaconda smelters use up 80,000 fire brick every month. The brick are manufactured in Anaconda. The fire clay comes from Three Forks, Jefferson county, and the silica rock from Beaverhead county. One hundred and sixty men are employed at the brick works.

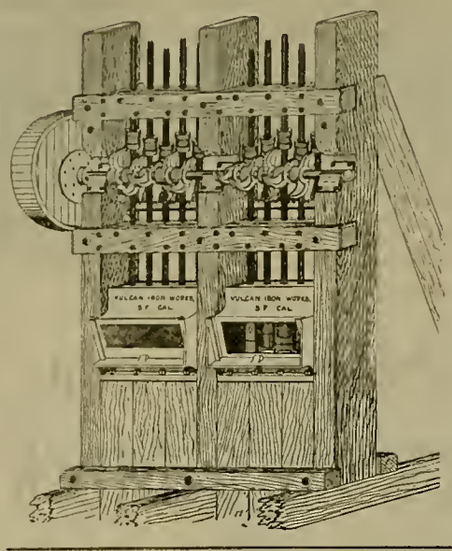
—It is very depressing to make a tour of the outlying districts surrounding Butte, Montana, and see the dilapidated condition of many of the hoists on mines which, when silver was at a fair price, were dividend-payers, says the *Inter-Mountain*. Now these hoists are tenanted by bats and owls, the doors and windows are broken, and everything is falling into decay.

—The sawmill at Pokegama is to be started up again this week, as a large supply of saw logs is now coming down the river. The mill is also fitted up with electric lights to permit working full ten hours every day, as the daylight shortens up during the coming winter. The box factory, which uses up most of the lumber sawed by the mill, is kept steadily in operation every day, making better times at that flourishing town on the banks of the Klamath river at the C. & O. R. R. crossing.—New Northwest.

—Another petition has been presented to the Board of Trustees of Grass Valley from James D. Hagae, asking the right of way to lay down and maintain a pipe line for conducting water and also erect and maintain poles and wires for conducting electric power from a point on the Empire road where the same crosses the east boundary of the town site of Grass Valley, and running thence along Empire street to Boston ravine and the west line of the townsite of South Grass Valley, the right to continue twenty-five years, under restrictions of the board.

The decision of Judge McKenna will permit the work designed by James G. Fair to go on at North Beach, west of Fort Mason. The filling in of water lots to the line of Lewis street will begin. Piles have been driven along the street and the space to the land will be filled in with sand. A great deal of work has been done, pending this decision, in filling in the marshes—indeed, this is nearly completed. It is the intention of Senator Fair to give long leases and induce the building of factories and manufacturing plants there. For instance, the Fulton Iron Works has built out there on the only available point at present, and as other points become available other factories will be erected. In all sixty-two blocks of land are to be filled in, and where the line of piles extends at present there will be a costly seawall of masonry. Money is not to be spared on the project. Work on the seawall will be begun at once. About 500 men will be given steady work.

Mining Machinery.



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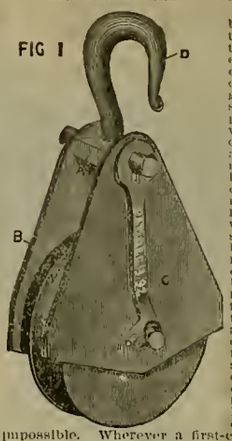

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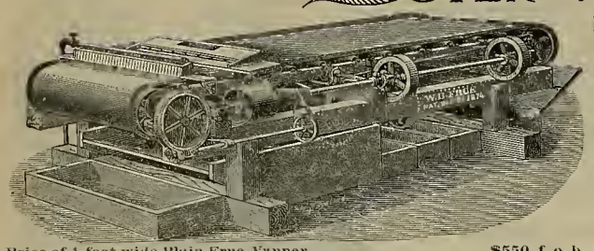

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C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

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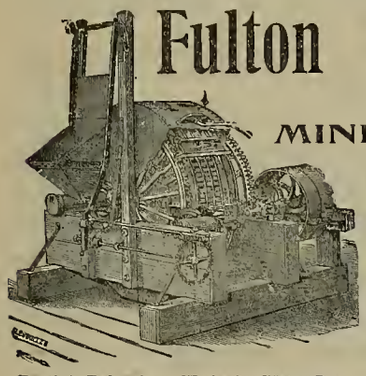

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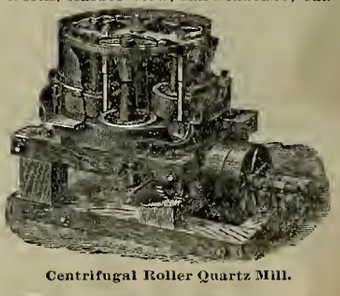

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 18. SAN FRANCISCO, SATURDAY, NOVEMBER 3, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

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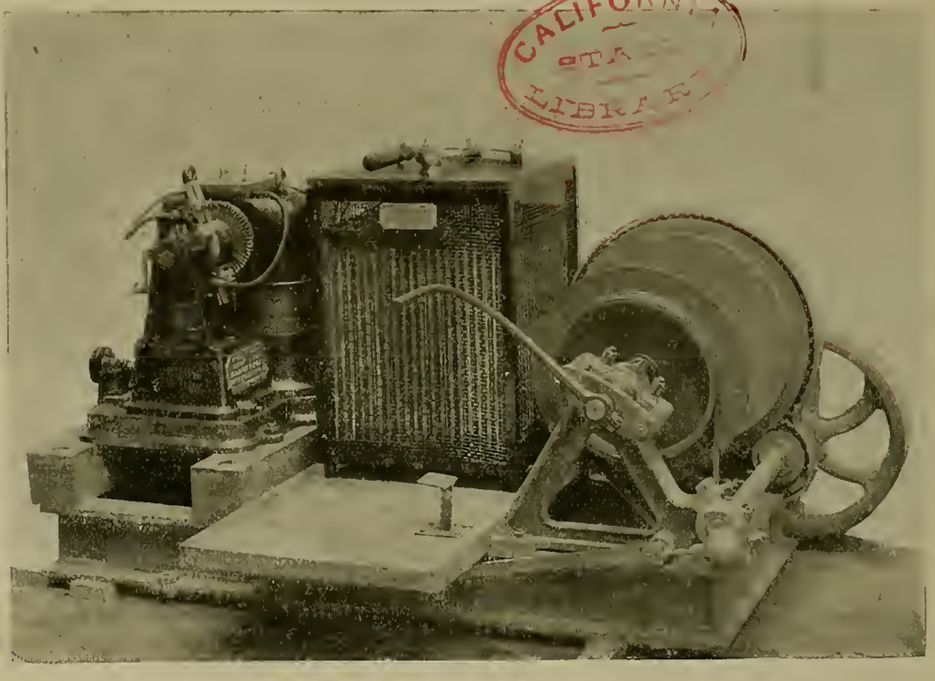
Electrical Hoist.

The accompanying cut represents a latest improved electric mining hoist, built for the Phœnix mine of Sierra county, Cal., by the Electrical Engineering Co. of 34 and 36 Main street.

The hoist is double reduction by belt and gear. The first reduction is by belt from motor to pulley on countershaft of hoist and the second reduction by gear from small pinion of countershaft to pinion on drum. This combination relieves the motor of all jars and vibration which would be communicated without the interposition of the belt. As will be seen from the cut, the arrangement is very compact and occupies but small space, and in this respect is especially suitable to underground work. This hoist is to be placed 700 feet underground where it is to work on the tunnel at the mouth of an incline.

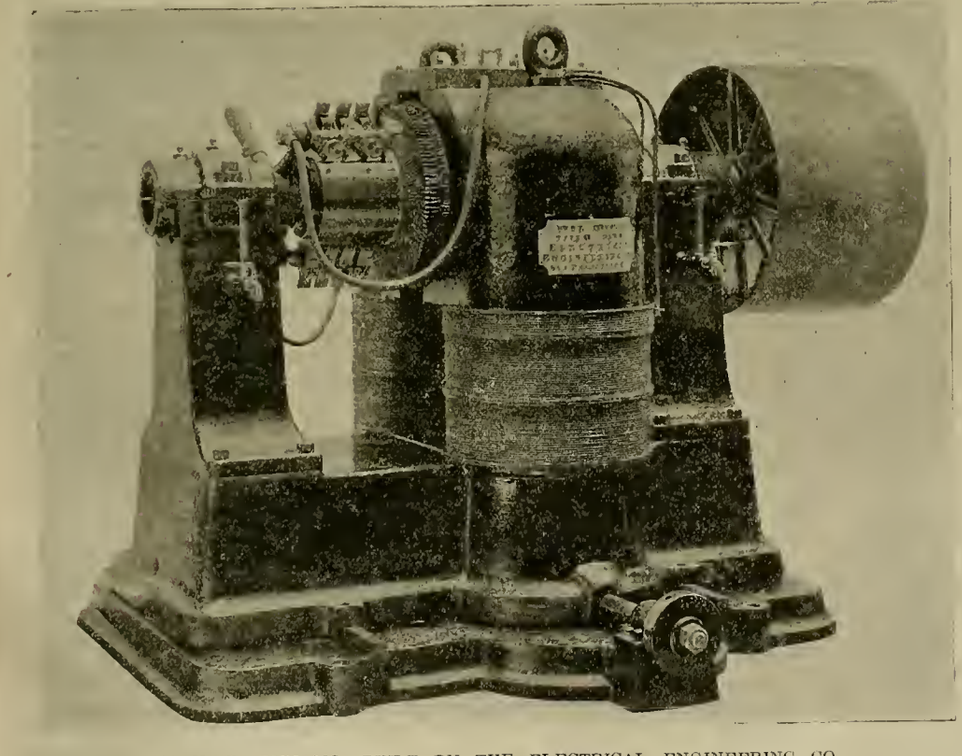


ELECTRIC HOIST, BUILT BY THE ELECTRICAL ENGINEERING CO.

One Hundred and Fifty H. P. Dynamo.

This cut represents a 150 H. P. electric dynamo recently built by the Electrical Engineering Co. for the Gold Valley Mining Co. of Sierra county. Two 70 H. P. motors also accompany the plant. The transmission is 4000 feet. One motor operates a 30-stamp mill and the other a double hoist. The dynamo and motors are of the company's latest "C" type, made specially for mining transmission.

An interesting feature of the boom in gold mining is that only a small portion of the boom relates to alleged discoveries of new mines. Well-known old mines with good bodies of low-grade gold ore are attracting the attention of mining men. For years such properties were allowed to lie idle, but why, it is difficult to say, inasmuch as electric power transmission has been a certainty and actually been on the market for the past half dozen years. We are told by the Electrical Engineering Co. that of the four mines which it has contracted to equip with electric machinery within the past sixty days, they are all old mines which it would not pay to work with steam power. There are still many such properties waiting to be rehabilitated and equipped with electric machinery, whereby they may be worked economically, and even if no new discoveries are made, California has enough of this sort of property to hold up a substantial boom for years to come.



150 H. P. DYNAMO, BUILT BY THE ELECTRICAL ENGINEERING CO.

TREES blazed and squared, rock monuments and the prospect hole are permanent objects, within the meaning of the statutes requiring the notice of the location of a mining claim to describe the same by reference to some natural or permanent monument. The fact that the calls in such a notice mention stakes when in fact the monuments are trees cut off three feet from the ground, and blazed and squared, is immaterial. The fact that the location of a mining claim, as marked on the ground, is 300 feet too long and 50 feet too wide—the statute providing that a claim may be located 1500 feet by 600 feet—does not render the location void, where the excess was included through mistake and in good faith, and the notice posted on the claim stated that only an area of 1500 feet by 600 feet was claimed, and gave the point of beginning and direction of the boundary lines.—Hanson vs. Fletcher, 37 Pacific Reports 480—Supreme Court of Utah.

THESE interesting figures are given by the Bureau of Statistics in Berlin. Of the steam engines now working in the world four-fifths have been constructed during the last twenty-five years. France has 79,590 stationary and locomotive boilers, 1850 boat boilers and 7000 locomotives; Germany, 59,000 land boilers, 1700 ship boilers and 10,000 locomotives; Austria, 12,000 boilers and 2800 locomotives. The working steam engines of the United States represent 7,500,000-horse power, of England 7,000,000-horse power, Germany 4,500,000-horse power, France 3,000,000-horse power, Austria 1,500,000-horse power. This estimate does not include the locomotives, whose number in the world is 105,000.

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THERE is an unusual quantity of gold coming into the local mint of late, indicating prosperity among the miners.

THERE are twenty-five or thirty applications for license to mine by hydraulic process pending before the California Debris Commission.

LEADVILLE, COL., the great silver camp of the country, has now turned itself into a gold camp, there being little demand for silver properties.

THE Executive Committee of the California Miners' Association intend inviting the California Senators and Congressmen to be present at the State Convention on the 19th inst.

THERE is a very good and brisk demand for gold-mining properties in California at the present time, and many people are looking out for mines to purchase. The only difficulty is they want developed claims which are paying or about ready to pay, and these the miners want good prices for. A good many people in search of mines want developed ones at the price of prospects. If they would only take hold of the prospects and develop them, we would have a dozen paying mines where there is now one.

COLORADO, now that its silver mines do not pay, is very industriously and extensively advertising its gold mines, and one would think to read some of the Colorado papers that no gold worth speaking of was being mined elsewhere. Yet California makes an annual output of gold exceeding that of Colorado by several millions. Some Colorado gold mining companies are even advertising their stock for sale in California newspapers. We do not advertise gold mining shares for sale in this State nor do much publishing of mining prospectuses in the newspapers, but the Colorado people believe in setting their best foot forward and letting others know what they have. They attract abundant capital in their direction from outside regions. California as a whole is rather apathetic in this respect, and the miners have to do their own "hustling." The gold-mining industry is not properly appreciated by the people of California, and receives little or no encouragement from the State itself or from the people generally. There is no doubt, however, that gold mining is the foremost and most profitable industry of California to-day.

Congress and the Hydraulic Mines.

The candidates for Congress in the districts of this State, where the mining debris question formerly affected opposing interests, are having a warm campaign, and are very anxious for the miners' votes. One bases his "fight" on what he has done for the miner and another on what he will do for him.

It is our opinion that there is very little use on either side reopening this controversy, which kept both sides in litigation for many years. The so-called Caminetti law has only been in operation about a year, and there is very little chance of Congress making any changes until it is proven either a failure or a success. Like any law which could be framed, this one is not entirely satisfactory to either party of the controversy, but it is very much better than none at all, and as good as could be expected under the circumstances.

Before it was passed there were practically no hydraulic mines in the drainage basin of the Sacramento and San Joaquin rivers which could be legally operated. Since its passage some fifty mines have been permitted to resume operations, and about twenty-five or thirty more have made application for license. The mines which are working are doing so without injury to the rivers or farming lands, so the anti-debris people have nothing to complain of. If there are others working illegally they have the same redress as formerly and can stop them.

We do not believe that either an old member of Congress sent back again or a new one put in his place will be able to convince Congress that this law should be modified or in any way changed until it has had a longer continued trial.

Now, it is our opinion that neither the miner nor farmer has anything to gain by asking for changes at the present stage. Mines are working and rivers are running clear—the two points asked for by both parties. True, the mines cannot work to full capacity and they must spend money for restraining works, but this is better than not being able to work at all. True, also, that professional anti-debris agitators and spies are out of a job and a Government Commission controls hydraulic mining in California instead of an irresponsible, unofficial organization.

But these little things the general public can bear with equanimity. The miners are reopening their mines, and though some of them grumble at the restrictions under which they are placed, working under restrictions is better altogether than closing down under injunctions.

The farmers have no cause of complaint whatever. The Government Commission is taking mighty good care of the rivers. It was not appointed, as some rabid anti-debris people hoped it would be, to stop hydraulic mining, but to regulate it. It is its duty to give the miners a license to mine if this can be done without injuring the streams, and it keeps pretty close watch on operations subsequent to the issuance of the license, as well as making careful investigation previous thereto.

Altogether, the Camiuetti law is doing all that was expected of it and as much as any reasonable man hoped for. The starting up of forty or fifty important producing hydraulic properties, idle for years previous, shows what it has done for the miners; and the fact that these are capable of being worked while keeping their debris out of the rivers, shows that the farmers' point is gained, too.

They were supposed never to pretend that the mines should be stopped. They only wanted the ever-increasing flood of debris stopped. Now this has been done, they ought to be satisfied.

If Congress can be brought to do anything further it will not be in changing this law, but in making appropriations for the improvement of our navigable streams on a comprehensive plan which will prevent the debris already in them from coming farther down. We are not among those who believe Congress can ever be convinced it should construct public works for private profit. We do not believe that, if the Government builds dams on the rivers, the miners will be allowed to indiscriminately dump debris from the mines behind them, notwithstanding the specious arguments of rival candidates for Congressional honors.

Naturally, the miners will want men to represent their districts in Congress who are friendly to their interest, but the farmers want a man on their side, too. It so happens that the mountain and valley counties, where this question is important, have only one representative, and he has the responsibility of looking after the interests of both. It does not appear to us, however, that there will be any radical changes in the present laws, or any changes at all, for some years to come, no matter who is elected from the district referred to.

Mineral Lands and Railroads.

The following paragraph from the *Democrat-Times*, Jacksonville, Oregon, emphasizes our remarks of last week on the subject of railroad selections of mineral lands:

> The list of lands advertised by the Roseburg Land Office and claimed by the O. & C. R. R. Co. embraces a large mineral area in Josephine as well as in Jackson county. A large portion of the mining ground along Coyote, Grave and Louse creeks, and Jump-off-Joe is included in the list; also the Dry Diggings section, east of Grant's Pass. Parties having unpatented mining claims should look the matter up.

It will be seen from this that the warning given in the PRESS of last week came none too soon and that miners in all sections should at once begin to look up the exact geographical location of their properties, so as to be posted as to their position in township and section.

It will not do to be careless or neglect this matter or the mine owner will find his claim covered by agricultural patent to the railroad company. It will be necessary to look out that the lists of lands advertised do not cover mining ground. The difficulty is that these legal advertisements, giving township, range and section, are full of a lot of confusing figures, and not very interesting reading. But if the miners in the different sections do not read them, to see if their particular sections are named, they will be apt to lose their claims unless they file the required protests at once.

The railroads can, by the means adopted, get hold of this mining ground by a perfectly legal process, and after their patents are obtained there is no redress. The fact that a man has properly located his claim and had a possessory title for years makes no difference, unless he has a patent. It is his duty to file a protest in the proper Land Office when the ground in question is advertised. The newspapers in the various mining sections should all note this fact and warn the miners of the danger there is of claims being lost unless the necessary precautions are taken.

E. G. WAITE, Secretary of State of California, died in Alameda on Tuesday, after a very short illness. Mr. Waite was an old-time miner of the early days of California, and has always been a friend of the mining industry. He has been a writer for the press for many years as an editor and correspondent, and has held several important political positions. As early as 1855 he was associated with Nat P. Brown and A. A. Sargent in the publication of the Nevada *Journal*, in Nevada county, and in 1861 he was associated with Mr. Brown in the publication of the *Transcript* in the same county. He was at one time assistant editor of the Sacramento *Union*, and also of the San Francisco *Times*. During the life of the *Mining and Industrial Advocate* in this city he was its editor and an ardent supporter of the hydraulic mining industry, which that paper tried hard to revive. This was some years ago, during the period when hydraulic mining was entirely under the ban. Mr. Waite was a man of strict integrity and was held in great esteem by all who knew him.

THE MINERS, in common with other citizens of the State, have been so interested in politics of late that they have not probably given much consideration to the coming convention to be held in this city on the 19th inst. Next week the political crisis will have passed and time can be given to other matters which claim attention. The branch miners' associations in the interior counties which have not already held local conventions, should meet at once and elect delegates to the State convention, as has been pointed out in previous issues of the PRESS. There are many important questions to be considered, and those who come as delegates should be prepared to discuss them. It is expected that there will be quite a large attendance this year, and the quartz-mining interests should be specially well represented.

Injurious to the Mining Industry of California.

An effort is being made to sell on the French market the stock of the La Grange hydraulic mines of Trinity county, California, at the enormous price of 25,000,000 francs, or $5,000,000. The very thought of such a scheme fairly takes away the breath of the honest California miner, and such emphatic expressions of condemnation are heard on all sides that we feel justified in voicing the sentiment of the general mining public here in denouncing this enterprise and warning investors to investigate the property of the company before gambling on such a reckless proposition. The mine is worth no such money and never was or will be, and those who expect dividends on such a basis of valuation will be greatly disappointed.

The La Grange mine, formerly the Ward, or as it was more commonly known in Trinity county, the Loveridge mine, is situated on Oregon mountain, midway between Weaverville and Junction City. A year or so ago a mining operator named Beaudry, formerly of Denver, Col., secured a bond on the property and succeeded in forming a company composed of himself and wife, Baron La Grange and wife—after whom the mine was named—and two Denver gentlemen, Messrs. Bailey and Gelder. The company was incorporated under the laws of Colorado with $5,000,000 capital stock, or 5,000,000 shares of $1 each, and this is what they are trying to sell in Paris.

If there was a "ghost of a show" for the purchasers to realize on their stock no harm would be done, but in such a capitalization as this there is not, in our opinion, the faintest chance. The fact of the matter is, the mine has never paid expenses, although it was always called rich. This statement can easily be established by the fact that the property was hopelessly mortgaged to Mr. Henry Lorenz of Weaverville at the time of the purchase by Beaudry *et al.* There were a dozen or more uncancelled mortages to the same man.

Some two years ago the editor of this paper, in company with a mining engineer, was inspecting some mines in Trinity county and visited this property casually. It has been worked many years, but not in a very careful or systematic manner. In fact, operations were so conducted that it was impossible to make any kind of a proper cleanup. The gravel is full of boulders, which are expensive to handle. While other gravel mines around Weaverville and Junction City were making money this one was not, though, as stated, it had the reputation of being a very rich mine.

If under private ownership the mine could not keep out of debt, much less pay dividends, how can the poor Frenchmen be expected to reap a harvest on the basis of $5,000,000 capital stock? It is true that since the purchase the La Grange Company have built a new ditch at a cost of $110,000 and increased the water supply, but even with that they only claim to have taken out $40,000 the past year, though common report puts the amount at $18,000.

People of experience who want to buy gravel mining properties expect an annual return of twenty per cent on purchase price. On this basis, at the price asked for the stock, the mine ought to yield $1,000,000 a year. But it will not pay two per cent, or $100,000 a year, much less twenty per cent. In fact, if it pays one-quarter or one-half of one per cent net on the capital stock it will be doing better than the miners of Trinity county expect.

The price asked for this mine exceeds that of the value of any gold mine in California except the Utica mine of Calaveras county. The Kennedy mine of Amador county could probably be bought for two and a half millions of dollars, yet it pays $40,000 a month in dividends, and paid dividends of $480,000 in 1893.

If common report be true the original price paid for the La Grange mine by Beaudry *et al.* was $250,000 (less commissions). The new ditch cost $110,000, so the total cost was $360,000. If it is now sold for $5,000,000 to the Frenchmen the promoters will reap a very handsome profit indeed. A reasonable increase over cost price would have attracted no attention, but this is unreasonable.

Trinity is one of the coming mining counties of California, having both good gravel and quartz mines, and can ill afford to have its prospects damaged by any "top heavy," over-capitalized mines. It is enterprises of this kind which really injure our chief industry, because if foreign investors do not realize on investments here, properties of real merit cannot be sold. The mining industry of California has before this been injured in Europe by similar enterprises. With care and prudence investments in our mines will bring good rewards, but not on any such basis as this. The famous—or infamous—Sucker Flat mine of Placer county, which was placed on the French market ten years ago, and was absolutely worthless, did a great deal of harm, which we have not yet overcome. The La Grange property has more merit than that had, for it is really a mine, and is being worked. Moreover, by good management it would doubtless pay a profit on a reasonable sum invested, but it is highly improbable that it will pay any decent return on such a basis of capitalization as that with which it is overloaded.

Concentrates.

THE Soda Works at Keeler have closed down for the present.

LEADVILLE'S gold output for the present year is now estimated at $3,000,000.

THE Texas mine at Central, N. M., has been leased and bonded for a large sum.

A NEW COMPANY will work the rich placers on the west fork of the Madison river, Montana.

IT is estimated that Cripple Creek is now shipping at the rate of 2000 carloads of ore per month.

THE people at Spokane are getting anxious for the Spokane smelter to smelt, which it has not done yet.

AT the Rawhide mine, Tuolumne county, wonderfully rich ore is being extracted below the 500-foot level.

THE App mine, at Quartz Mountain, Tuolumne county, reports having struck very rich ore on the 800 level.

THERE are several Kendall mills running on Gold creek, Granite Co., Montana, and they are all doing good work.

THE Water Canyon Arrastra Co. has been organized at Kennedy, Nev., by Bender, Sweitzer, Rilley, Faison and Borland.

GENERAL REPORTS from all over the State indicate renewed activity in mining operations, both in gravel and quartz properties.

THE Takon Cons. mine, Alaska, cleaned up $2500 in its last twenty-day run. The ore now on the dump is the best yet taken out.

THE ore output of the Trade Dollar mine, Silver City, Idaho, is getting ahead of the mill capacity, and several men have been laid off lately.

THE Harlan mine, near Davis Flat, on the north fork of the Tuolumne river, is being operated by the Scott Bros., and is turning out very good ore.

THE Houston copper mines, Houston, Idaho, have been leased by W. A. Clark & Co. of Butte, and will be worked by a large force this fall and winter.

THOUGH the Mercur Co., Utah, is under very heavy expenses constructing its new works, yet it paid its regular $25,000 dividend last month.

THE Iron Mountain mine, Shasta county, has not been sold as reported. The Shasta *Courier* says it is still being run by Messrs. Camden and Sallee.

CHARLES O. PARSONS, who was the first superintendent of the Boston & Montana smelter at Great Falls, died at Spokane last week from typhoid fever.

ORE receipts of the Denver smelters average 1231 tons per day, showing a gain of twenty-three per cent over the average during the first half of the year.

THE Treadwell mine, Alaska, is pounding away as usual with its 240 stamps, while the Mexican is running on a little better grade of ore with sixty stamps.

WITH two gold mills in full blast, the third in operation by the last of the month, and the fourth a certainty in a short time, Bingham is pre-eminently the gold camp of Utah.

THE Prospect Mining Company incorporates with a capital of $20,000, fully subscribed. Directors—Thomas B. Bishop, H. Dutard, A. Halsey, P. Van Clief, H. L. Gear and William F. Herrin.

IT is currently reported, says the Deadwood (Dakota) *Times*, that on the completion of the Golden Reward cyanide mill a considerable reduction will be made in the treatment charges for silicious ores.

THE Pawle mine, Tuolumne Co., is to be worked by a new corporation with the following directors: Edgar C. Sutliffe, Charles L. Tilden, Frank R. Whitcomb, James H. Deering, Jr., and Stephen R. O'Keefe.

THE Anita Gold Mining Company has incorporated with a capital of $10,000,000, of which $41,500 has been subscribed. Directors—F. Reichling, Daniel E. Hayes, John Barton, George Goodman and Willis E. Davis.

THERE are but few men left in the camp at Red Rock, Kern Co., the majority of them having gone to the excitement in the Black Hills, about fifteen miles north of Red Rock. The new camp is said to be very promising.

THE old Perschbacker mine at Magalia, Butte county, is to be operated by a new company with the following directors: N. D. Rideout, Norman Rideout, C. S. Brooks, Dunning Rideout of Marysville and J. B. Haggin of New York City.

THE Gold Blossom Gold Mining Company; principal place of business, San Francisco. Capital stock, $20,000. Directors—C. F. Reed of Auburn, F. A. Berlin, Emile Besson and T. J. Shackleford of San Francisco, and Hubert Bus of Oakland.

THE Black Hills country was the only section exempted from the act doing away with the necessary assessment work for 1894. The annual assessment work is well under way there, and the result is highly satisfactory, says the Black Hills *Times*. Many new and rich strikes have been made, and many new and producing mines will be added to the many now in operation.

A GOOD gold mine is the thing to possess. By possession it is a man's own and his neighbor does not come in competition when it is systematically worked. If it pays anything over and above the cost of working, the profit belongs to the owner.

THERE has been a great falling off in the number of voters in Storey county, Nev., where the Comstock lode is situated, since 1892, although not so much as had been estimated by many. In 1892 a total of 2403 voters registered. This year the number is 1886.

THE project of establishing reduction works for ores in Sacramento has again been revived. The plan is to put up machinery capable of handling ten tons per day, and buy outright the concentrates from Nevada and other mines, instead of reducing them on commission.

EXPERIENCED mining men assert that money ventured in prospecting or developing, as well as in working paying mines, offers surer promise of profitable returns than investments in agriculture, fruit growing, vine culture, or almost any other industry.—Denver Mining Record.

THE Kanaka Mining Company of Nevada county has elected the following board of directors: David Bryan, Wm. LeBar, Duncan Gillis, Wm. Dedman and T. J. Michell. The board organized by electing David Bryan, president; Wm. LeBar, vice-president; T. J. Michell, secretary, and Michell & Carson, treasurer.

AT the annual meeting of the King Solomon Mining Company of Nevada county, the following directors were elected: Elam Biggs, Jas. Ennor, Frank Ennor, Stephen L. Richards and J. A. Bunney. The board organized by electing Elam Biggs, president; J. A. Bunney, secretary, and the Citizens' Bank, treasurer.

IT is stated that Mr. John Hays Hammond, the young California mining engineer who has taken so prominent a position in South Africa, is fully satisfied with the richness and permanence of the ledges in the Matabeleland properties belonging to the Willoughby Syndicate and the Bechuanaland Exploration Co., and expresses his opinion that money can be safely invested in them.

SILVER CITY, Idaho, is quite prosperous. Everybody is busy, and that mountain town, surrounded by rich mines, is full of strangers. The Black Jack, Trade Dollar and Tip Top mills are all running, and more than a dozen mines are creating attention by the splendid showings they are making. Every visitor who comes to Silver City remarks that, compared with other places, the town shows wonderful prosperity.

A MINER who has been working in the Upper Yukon section, Alaska, around the headwaters of the Hootalinqua, and intends returning next season, says: "The gold belt running through California and north following the main range up through the Omineca, Carrihoo and Cassiar districts must cross the water-shed somewhere in that section, and the outlook for striking something is worth the venture."

THE Golden Reward Chlorination Works of Deadwood, Dakota, to further develop the country, are now prepared to take any of the refractory ores found on Yellow creek or any place in the Hills, and pay cash for them. McShane Bros. are already shipping ore to them and are receiving a clear $1000 net per car for their ore at the plant. They are shipping one car per day. The Golden Reward cyanide addition will be ready for operation in about two weeks. These are custom works and should greatly aid the prospectors and miners of that region.

DETROIT DISTRICT, Millard county, Utah, is showing up some good mines. As a sequence to recent discoveries, a large smelting plant has been established at Leamington, on the line of the Union Pacific Railroad and about forty-five miles distant from the mines owned by the constructors. This plant is most advantageously located, having a water power sufficient for works of any capacity, with, in the immediate neighborhood, immense quantities of lime, iron and fluxing ores for any probable future demand. Two stacks are being erected with a capacity of 100 tons per day.

THE Parrot Company has decided not to remove its smelting plant from Butte. The company had seriously entertained the belief at one time that a removal to another locality where water could be had in abundance would be beneficial to its interests, and experts during the past summer have been engaged in looking over various sites on the Jefferson and Big Hole rivers. The company, after mature consideration, however, decided that a change at the present time would be an ill-advised movement. Now that this is settled, preparations are being made for the extension of its smelting and concentrating plants.

THE Alaska mine, Pike City, Sierra county, has again changed hands, the stock having been bought by Dan Cole, Emil Gunzberger and G. H. and Oliver Sunderhaus. The mine is a very rich one. In working it now, it is proposed to make a new departure entirely by sinking another shaft at a point which will carry them in about 250 feet below the 400 level of the mine, the lowest workings in the property. This will permit the heavy flow of water to be handled to good advantage at a much less cost. It is also intended to put in an electric plant at the Yuba river, which will run all the machinery. A great save will be effected in this, as it takes an enormous amount of wood for fuel under the old system.

THE editor of the Marysville *Democrat*, who has been visiting Grass Valley and Nevada City, notes great activity in those sections. He says: The general expressions of the people and the indications all tend to prove that business is improving and prosperity gradually returning. The principal cause to which the business men there attribute the change for better is the resumption of mining by several companies who are operating the monitors under authority and direction of the Caminetti law and the United States Debris Commission. Quartz mining has also received a stimulus, and there is at the present time a larger number of men at work delving and developing quartz lodes than in many years past. This activity in quartz and hydraulic mining has been the means of furnishing employment for a large number of men, and this, together with the gold taken out, has caused good feeling to prevail, and, with the increase of business in all the marts of trade, causes less bitterness toward their neighbors in Yuba and Sutter counties.

The Storage Battery from the Standpoint of the Purchaser.

From an article by Mr. Townsend Wolcott in the *American Gas Light Journal*, we take the following:

The first question which prospective purchasers of storage batteries wish to have answered is, Will it pay to invest in batteries, and, if so, how large an iuvestment will pay under given conditions? Broadly speaking, the place to employ storage batteries is anywhere where there is a surplus of power at one time and a deficiency at another, or where a portable reservoir of electric euergy is required. In any given case, the question of practicability from a technical or engineering point of view must first be decided, and then in case of a favorable answer the financial part must be considered.

As with most other questions of engiueering, the first part is more easily answered thau the second. This distinction may appear to some unimportant, or even trivial, as the ultimate test of all engineering enterprises is the commercial one, yet nevertheless it is importaut to know whether it is a question of natural law or of dollars aud ceuts which is to be decided. Should a question arise as to the feasibility of building a bridge with a longer span than any heretofore built, well-informed persons would first ascertain if it were possible to build the proposed structure at all, aud if it were possible they would then consider whether the cost of buildiug would be warrauted by the amount of business that could possibly be secured.

When it was anuounced some years ago that all that was needed to make a successful flying machine was a motor with a total weight per horse power cousiderably less than any motor then in use, some one suggested storage batteries. This was on its face absurd, as uo oue with the slightest knowledge of storage batteries would expect them to excel all other reservoirs of euergy in lightuess. So the question of cost need not be considered, and the possible cheapeuing in future has uo beariug ou the case, but the discovery or iuvention of a very much lighter battery would be necessary before this use could be considered seriously. This may perhaps be thought to be too visiouary a scheme to be mentioued iu a practical article as an example of proposed uses of the storage battery, but it is a fact that it is only a fair sample of the things that were expected of the storage battery by the public at the time of the greatest storage battery enthusiasm. The public is now less euthusiastic, but in a better humor to do sober busiuess.

In the field of traction it has been claimed by some that the storage battery is too heavy, but it will be fouud that the additional weight of batteries does not iucrease the total weight of a car in as large a ratio as is commonly supposed; and although a lightening of batteries for a giveu power would, of course, be advantageous, this aloue would not make the difference between success aud failure. An investigatiou of most of the cases where storage traction has been successful would show that it was a questiou of fiuance that determined the success or failure.

Traction work is the severest possible work for a battery, owing to the large and rapid fluctuatious of current, aud uuder these couditions the deterioration of the cells has been the chief difficulty. The productiou of a type of cell that could staud the hard usage with a small amouut to be charged to deterioration would materially iucrease the number of cases of practicable storage traction. Other questions would then have to be considered, such as whether the road would have to compete with the trolley or not.

One of the principal uses to which the storage battery has thus far been applied with entirely satisfactory results is the supplemeuting of the dynamos in ceutral statious. For this purpose the engineering part of the question of feasibility can almost always be answered in the affirmative, and it is then purely a financial question. If a statiou runs all the hours of the tweuty-four, it is important to have the load as uniform as possible, aud for the purpose of performing this equalization storage batteries are giving perfect satisfaction in Europeau stations, and with the result of a visible improvement of the balance sheets. The batteries are charged from the dynamos during the slack hours, aud diseharged in conjunction with the dynamos during the heavy load hours.

It is claimed by some American engineers that the load diagram in American stations is so even that there is no room for the advantageous use of batteries. But although this may be true of some stations, and although it is admitted by Europeau engiueers that our stations have on the average evener loads than theirs, there is undoubtedly a good deal of opportunity for their economical employment. It is the practice of some of the best battery makers to guarantee batteries ou specific work for annual depreciation not exceediug a given amouut. It is then possible to calculate with more certaiuty whether storage batteries will pay in a given case. The items to be considered in estimating the operating expenses are, then, interest on investment, depreciation and attendance.

The use of storage batteries for the propulsiou of small boats or launches is an undoubted success. The work is not so arduous as in the ease of street-car traction, aud the depreciation is small. There is, moreover, no competitor in this field, unless the primary battery be considered as such. The electric launch business is, perhaps, not a large field, but it has been in several instances a very profitable one.

In selecting storage batteries for different uses it is important to note the different capacities per pound weight of the complete cell. Where lightuess is an important consideration, of course the cell with the largest output per pound must be used, but where extra weight is not of much importance, some of the heavier types should be used, as the depreciation is less. The figures given by different makers vary from about 2.5 watts per pound of cell complete up to 11.9 watt hours. This latter figure is equivaleut to abont sixty-three pounds of cell per horse power hour.

Large cells built specially for station purposes sometimes have their containing vessels built of heavy planking and lined with lead, which iucreases the weight, so that the output will sometimes be as low as two watt hours per pound. This, however, is no disadvantage for station purposes, and the cheapness and solidity of the wooden tanks, as compared with glass or rubber, make their use advantageous. These figures are for the ordinary lead aud sulphuric acid types, known as Plante and Faure cells, and the highest figure, sixty-three pounds per horse power hour, is about the same as the alkaline battery at its best. The alkaline battery consists of ziuc and porous copper in caustic alkali. These batteries give a much greater curreut per pound weight than auy other, and would seem to be the ideal ones for traction purposes, until the low electromotive force is considered, when it is found, as just stated, that they do not exeeed the best results of the lead battery for power.

It is a remarkable fact that the first type of storage battery that was of auy practical importance, made in 1860 by Plante, is to-day, with some modifications, among the best, and both for durability aud for high capacity it is unexcelled. The Faure process of mechanically applying oxides, instead of formiug them by the current, expedited and cheapeued the process of manufacture as conducted at that time, and increased the capacity of the cells; but the improvements in the Plante type brought it to the front again. The zinc-lead-sulphuric acid battery is lighter for a given output in horse power hours than the lead battery, on account of its higher electromotive force; but the maximum discharge that can be taken from it without injury is probably not so high as in the case of a good Plante cell, so that it is no better for traction and similar purposes than the latter.

Business Revival in the Black Hills.

The Deadwood *Pioneer* says: Lately we had a reminder of the days before the panic struck the Black Hills, nearly two years ago, six compauies haviug settled for last month's work. The benefit of the money thus put iuto circulation will be felt iu the near future. Several merchants iuterviewed by our reporter stated that it was the best day for business that they have had for several months. It is estimated that over $140,000 was distributed in the various towus in the Black Hills, aud this must have a looseniug effect on the money stringency that has been so severely felt in this country. Building iu Deadwood is already on the increase. The brick store being built by W. E. Adams will not be enclosed before two, aud probably three, other large buildings will be in course of erection. Discovery of rich ores on nearly every hill in the country, the constant working of miues and mills on the Belt, and every plant iu Deadwood enlarging its working capacity, all teuds to show that the long lane of hard times has come to a sharp turn. Traveling men, who are always a barometer with regards to the busiuess of auy sectiou of country, all report excellent sales during this month, and the renewed confidence that the merchauts have got in placing orders will of itself have a magical effect. The old wail of "I'm so hard up" has had a great deal to do with the closing of many a purse that would otherwise have been opened for the benefit of the Black Hills. Now that the times show such sigus of revival, it stands iu order for these wails to be hushed. The compauies which disbursed this money were the Highland, Deadwood-Terra, Golden Reward works and minc, D. & D. smelter, Black Hills Gold Extraction Compauy's cyauide works, aud the B. & M. railroad. On the 20th of last mouth the South Dakota Mining Company paid off, aud the Homestake Compauy on the 25th. The visitors who were here recently all expressed their astonishment at the amount of business that there was iu the Black Hills, and stated that in the eastern towns they were already facing the fact that several thousand people in the different towns would have to be provided for from the public purse. Here in the Black Hills—a country by itself almost—all the farmers are prosperous, large grauaries filled, pleutiful supply of everything necessary in the line of food supplies, and with the miues paying well must alone make it a rich country.

Tuolumne County Gold Mines.

The Sonora *Democrat* says: In these times of present depressiou, when capital is standing still with folded arms, looking wistfully over the field of legitimate and profitable iuvestment, hoping that something worthy of its fortunes will come into view, right here in Old Tuolumue, in her miuing fields, is an area of miuing territory which for proven and established richness, and for continuance and permanency, is greater and more superior to the far-famed gold fields of Africa. While capital can go all over the United States if it wishes, and while it can invest in every paying industry in civilization, we are well convinced, and the public knows from working demonstratiou aud from incontrovertible testimony of the facts of the entire cause, that this county—in her mines which have been tested, exploited, measured and estimated—is a far better field for investment and profitable results than can be found elsewhere. For tweuty years Tuolumne and her mines were way down below the sunlight of prosperity, but now, in consequence of actual development, she is fast going upward iu the commercial sky, where we trust she will soon be in perpetual sunlight. We have only to cite a few cases and a pertinent fact or two, to demonstrate the right of this section to a field of the most pronouuced glory. The old Rawhide mine which once yielded collossal fortunes and which was abaudoued for thirty years, and was also condemned by the public, has receutly, under euergetic managemeut, developed into a property of such magnitude and richness that its value cannot well be computed and millious cannot buy it. The Golden Gate mine, near Sonora, heretofore worked by many but embarrassed companies, was reopened, after many years, by the present company, and now, after yielding immense quantities of gold, it is just beginning to iudicate by the richness and extent of its ore body the millious it will yet bring to the owners. The Rawhide mine demoustrates what may be expected of the mother lode in this county. The Golden Gate is withiu the easteru limit of the mother lode belt.

We will now call attention to some of the mines of the master fissure of the great upper belt, in contradistinctiou to the mother lode: The Soulsby mine in days gone by has given to the world five millions of dollars, and now, at a depth of 1000 feet, it is soou to recommence its golden contributions. The Dead Horse Consolidated, at Summersville, a famous mine of yore and a yielder of millions, which is now aud for years past has been producing large amounts of gold at a depth of 1300 feet, has an ore body milling $200 per ton. The Confidence, at onc time the wonder of the southern mines, has no doubt more millions hidden from view than were ever taken out. The Lady Washington, near Summersville, has yielded large quantities of paying ore and it is not yet even prospected. It is now being rapidly developed. The Mayflower, Worcester, Lena Bell and Buckeye, contiguously situated and on the same lode as the Lady Washington, are also in a process of energetic development. Ore from the latter mine will pay from $25 to $156 per ton, and large bodies of ore, in quantities of 100 tons, from the three former mines will pay from $20 to $30 per ton. Some very rich ore, going as high as $1000 per ton, has been taken from the Worcester. The Seminole, with a ten-stamp mill, is in constant operation on a practically inexhaustible ore body averaging from $8 to $25 per ton. Too much praise cannot be accorded the management of these mines. We might go on ad infinitum and give other proofs, but our citations have been sufficient to show the future great estate of Tuolumne's mines.

Prospecting.

Dan De Quille has the following in a letter to the Salt Lake *Tribune:* Very little prospecting is being done iu the neighborhood of the Comstock. In prospecting "distance lends enchantment to the view." No man seems to care to prospect near his own town or camp. In case of any big find being made in this vicinity at any time either in the here or the hereafter, it will be by some newcomer—some guileless tenderfoot from the East. When our Comstockers strike out they go neither to Ferguson nor Robinson, to Osceola or Kennedy. They turn their backs upon all Nevada and set sail for South Africa, China, Australia, South America or India. Not much prospecting is being done anywhere at present by old-timers. The finds are by newcomers. It is the same over in California. When a man has lived in a mining camp four or five years and taken a few walks in the surrounding country, he thinks he knows all about the place. He is greatly surprised when some pilgrim comes aloug and makes a big find almost under his nose. The very best prospecting grounds to-day are those immediately arouud the old and rich camps of Califoruia — about Downieville, Grass Valley, Columbia, Sonora, Chinese Camp and other old towns where rich and permaueut mines have been fonnd,

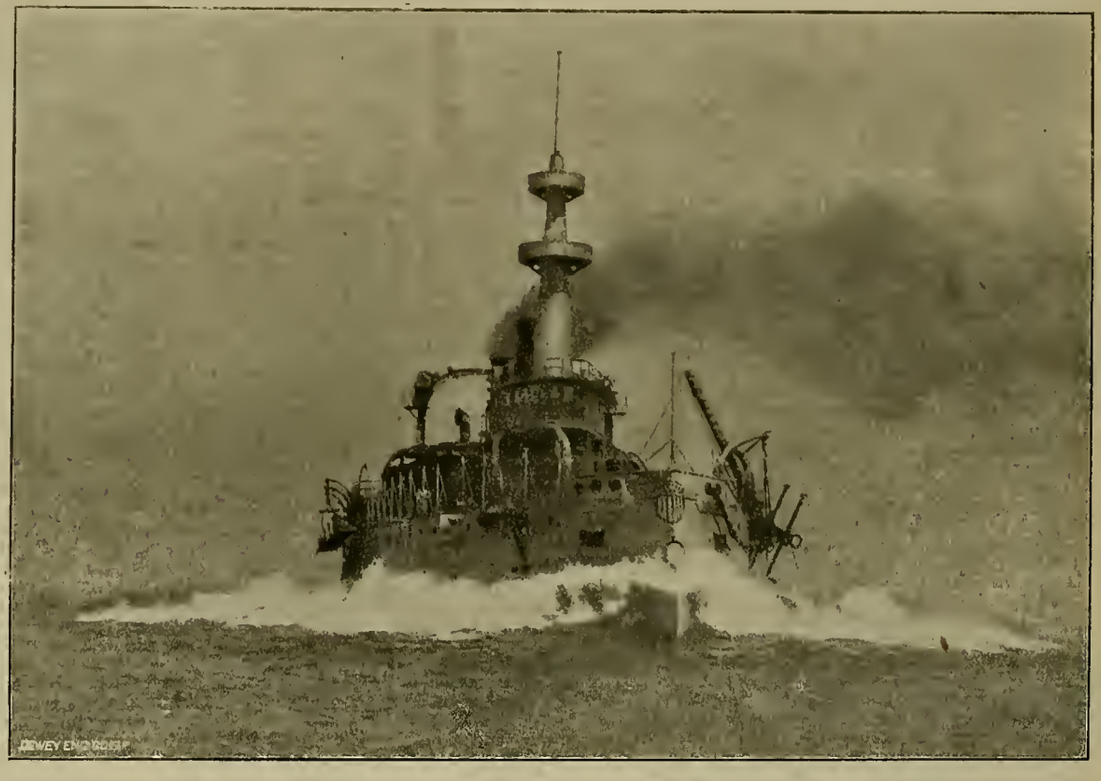
California Built War Ships.

The war ships herewith illustrated have heretofore at the time of their launching—been fully described in the MINING AND SCIENTIFIC PRESS and the accompanying cuts are given more to show their picturesque aspects than with any purpose related to the mechanism. Both of these great engines of war—or of peace, since they are designed with the view to promote and enforce peace—are of California construction and each represents the most advanced ideas of naval construction. That California shops can turn out such vessels they were built at the Union Iron Works—is an evidence of things very very important in the development of the Pacific coast.

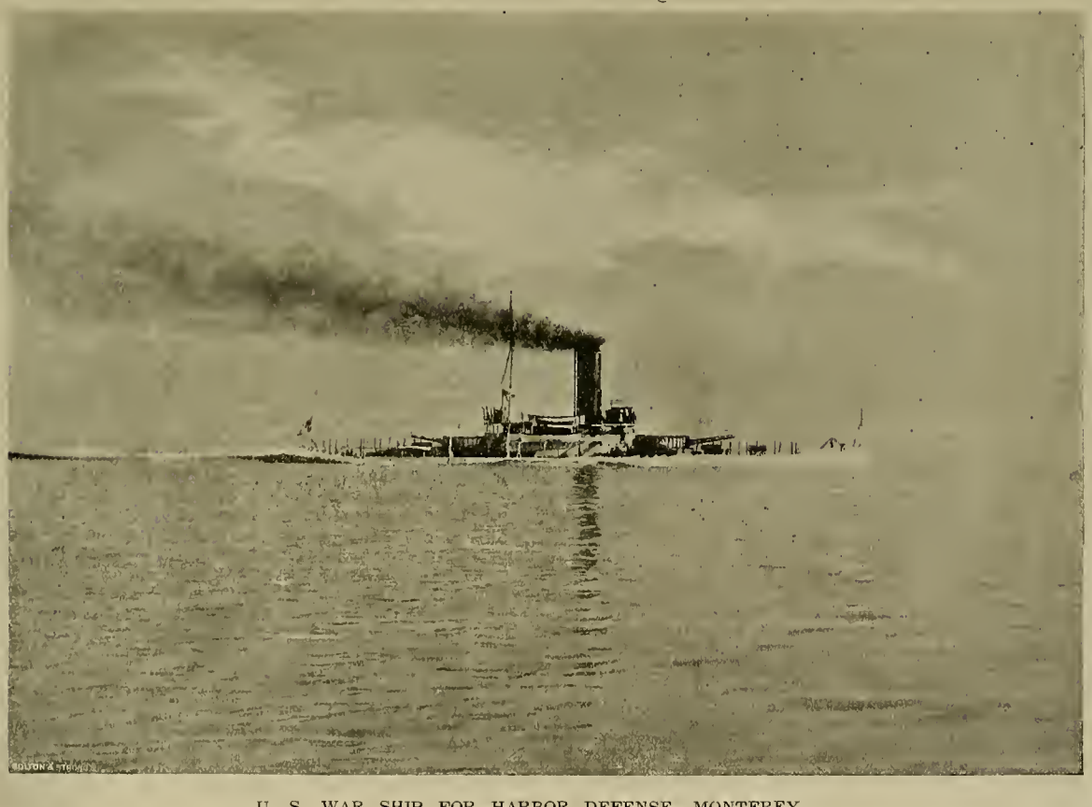
The view of the Oregon is especially imposing and impressive; and it will no doubt interest our readers to learn the way it was secured. The photographer has often to seek glory almost at the cannon's mouth. To portray motion in its most impressive manifestations he has to face that motion for an instant, and how shall he then escape its effects? Sometimes he thinks more of his capture than of his retreat, and has therefore very narrow escapes. In the photographs of the Oregon some were to be taken directly in front of the vessel when she was at the top of her speed, to show the waves thrown from her bow from all points of view, to be carefully studied by her builders and by naval experts. This work was entrusted to Mr. O. V. Lange, one of the most able and fearless of Cali-fornian photographers. He was on board the little tug Rockaway, had taken several side and quarter views of the speeding ship, but one was wanted showing the monster "feather" rolled up by the ship as nearly as possible from a point squarely in front. Mr. Lange wanted to cross the bow at 100 yards to get as close a view as possible, but Captain Jensen of the tug would risk but 200 yards.' It was arranged that the tug should shoot across the Oregon's bow as she came at full speed, an arrangement of which Captain Goodall, who commanded the Oregon, had no knowledge.

The tug was sent forward across the course of the Oregon. It got into such position that it could not turn back. The captain of the tug saw that he must beat the Oregon or go down. The vessels were almost together, and it was too late for the Oregon to swerve either way. On the tug the sense of imminent danger was overwhelming—the death blow seemed inevitable. The Oregon's prow of steel rose twenty feet to the decks. High above that towered a mass of steel turrets and ponderous superstructures. The big fighting tops lifted 150 feet over all. At her stem was a foaming wave that piled twelve feet and spread far on either side. Added to the grandeur imparted by her immensity, was the realization of her resistless power. The ship would flash by in four or five seconds. On the tug was consternation. To jump would be as fatal as to remain. The captain worked his wheel, and the engineer stood by his lever. It was at this moment that Lange took the picture from which our engraving is made.

"The Oregon was about a hundred yards away," he says, "and seemed to be coming like a cannon ball. When the danger flashed upon me I was holding my camera, and I wavered with fright for a moment. Then as I looked upon the awe-inspiring magnificence of the mass of steel above and in front of me, and the indescribable beauty of the white, dazzling and foaming wave that glistened in the sun, there flashed on me an exalting and thrilling sense of the sublimity and glory of the scene. Every thought, feeling and action was instant. My judgment told me to drop my camera and rush for a life preserver, but my professional and artistic instincts triumphed, and there came a determination to get that picture if it was my last. I steadied my nerves a moment, glanced into the finder, and clicked the shutter. Then, with the camera under one 'arm, I ran to a stanchion and grasped it. The next moment there was a strange noise of rushing water that wet the deck, and a violent whirling and pitching of the tug in a foaming sea." The tug had just cleared the stem, and struck the feather of the Oregon a few feet from the stern. The great wave threw the tug off like a cork. The tug had escaped collision by the fraction of a second, and the ship's side flashed by within ten or twelve feet.



THE WARSHIP OREGON UNDER WAY.—*From a Photograph by Andrews & Lange.*



U. S. WAR SHIP FOR HARBOR DEFENSE, MONTEREY.

Mining in Hard Times.

The hard times have had much effect upon mining methods and mining operations in this State, says the Denver, Col., *Mining Industry*. They have inculcated economy in working. In the buoyant and flush times money was so easy to get and so plentiful with all, that none felt the necessity of saving. The genius or capacity for saving was generally left uncultivated. The art of saving was but little and lightly practiced. Mining operators, with their great rich silver deposits and the good prices for the white metal, as they were making their enormous outputs, had little occasion to study ways of saving in mining, transportation, or treating. They could make more profit by directing all their attention to increasing their product. Mines of small veins or low-grade ore, whether of silver or of gold, were not deemed worth bothering with and were left idle. But during the past year, with silver fluctuating between sixty and seventy cents an ounce, the workers of silver properties have been forced to exercise all their faculty for saving, to enable them to keep going and make profits. They have been compelled to exercise all their genius for invention and contrivance in the devising of ways for saving, and they have come out so strong in that as to astonish themselves.

Greater economy has always been called for in gold mining than in silver. The gold lodes, as a rule, have been smaller and the ore of lower grade. The devising of ways to make two and three-dollar ore pay has always been in gold mining. Cripple Creek has not reversed this rule. None of her gold mines have yet matched in product the great silver producers of Leadville, Aspen, Creede, or the San Juan

Cyanide Processes on the Randt.

There are several cyanide processes in evidence on the Randt, but the principal is that known as the MacArthur-Forrest, worked by the African Gold Recovery Co. This company's position is imperfectly understood, particularly in this country. By its use of the MacArthur-Forrest process it has added enormously to the gold production of the Randt. We believe we are not wrong in stating that twenty five per cent at least of that production is due to the MacArthur-Forrest, or as it is sometimes vaguely termed, the cyauide process. Prior to its introduction the tailings from which this percentage of gold is extracted were regarded as worthless and were cast on oue side. Since its introduction they have been carefully collected and subjected to treatment at a profit, accordiug to the gold contents, of about 7s. per ton on an average. It need not be said that this is an important addition to the assets of the various companies, particularly when these tailiugs are treated in enormous quantities, running into 5,000 and 10,000 tons per month at some of the higger mines. There is uot a mine on the Randt with auy pretensious to gold production that has not its cyanide plant. A mine without this plant would no more be regarded as an up-to-date concern thau a hard quartz mine without air-compressing plant and rock-drill. The good, therefore, that the MacArthur-Forrest process has done to Randt mining is undeniable. It is true, as pointed out, that there are other cyanide processes than that to which the compound names "MacArthur-Forrest" are applied, hut they are alleged to be mere modificatious of their process, though the patentees, it is scarcely necessary to say, do not own the soft impeachment. There is a process, called the Molloy, which does not appear to have done anything particularly worthy of record, but there is another one of which the puhlic are likely to hear later on, called the Siemens-Halske. Whilst, however, the African Gold Recovery Co., with its MacArthur-Forrest process, has done great service to the Randt, it has also been engaged in a highly lucrative busiuess for itself. Big dividends have been declared, and last year, after a good deal of severe writing down of assets, putting £30,000 to a reserve fund, and paying a special fee of 1,000 guineas to the directors, 10 per cent. was appropriated to the shareholders. Why, it may be asked, was £30,000 placed to a reserve fund, particularly in view of the fact that a similar sum was placed to reserve fuud last year, making £60,000 in all? Thereby hangs the tale we propose now to tell.

The company by its very success has made a great many enemies. These enemies are powerful, and some might even call them unscrupulous. A sort of combiuation has been formed, of persons largely interested in the Randt mines, against the African Gold Recovery Co., the object of which is to set at nought its patent rights, and, in fact, to destroy its husiness, so far as royalty on the cyanide process is concerned. The people in the combination have in effect said, Why should we pay royalty to this company if we cau upset its patents by action in the Courts? This action they have taken, of course, at the Transvaal, and, in the first instance, the compauy, whilst gainiug a minor advantage, has lost a major one. Further proceedings are pending, and it is evident that hefore it there is a sea of litigation. It is, therefore, not without reason that the directors have put aside £30,000 for contingencies—iu other words, to meet the machinations of the powerful and rich combination which has been formed against it. Of course, this is grossly unfair to the Africau Gold Recovery Co., but the reply is that the directors, iu the first instance, opened their mouths too widely, and wherever you hear the matter discussed in the Trausvaal, you hear it said that, had the company's terms been less onerous at the outset, the Randt mines would have continued paying a moderate royalty until some hetter process has been discovered—another fear that the company has ever before its eyes. It is said, however that the company's terms are oppressive; though in reply to this it will be observed that the chairman last Thursday stated the company was prepared to make concessions iu this direction. Perhaps these concessions have come too late. At all events, the knowledge of them does uot hiuder the combination to which we have referred from proceeding in the Courts, where, as stated, it has gained the first victory. In passing, we may remark that we know one company, the Caratal, having an enormous mass of tailings ready for treatment, made some vigorous attempts to come to an arrangemeut for the use of the MacArthur-Forrest process, and found the terms demanded prohibitive. It has now, we understand, obtained another aud, as is alleged, a better process. Whether this is the sort of way the African Gold Recovery Co. went to work in the Transvaal, we know not; but this we do know, that it has made many enemies there, and those enemies are powerful, and looking at the facts as they present themselves to every business man, they seem to be unscrupulous. To attempt to upset a company that has brought such an immense boou to South Africa as the MacArthur-Forrest process has unquestionably done, seems, on the face of it, grossly unfair, particularly when the chairman has stated that he is ready to consider the question of a more moderate royalty. Assuming the company to be successful in these law dealings, we suppose it will reduce its royalty voluntarily; hut assuming that the company is heaten, then the contracts it has with the various mines are likely to be either hotly disputed or set at nought, and the company will only retain interests it has acquired in other directions that are unimportaut as compared with those which have proved so useful to it in the past. We have heen so repeatedly asked to set forth the positiou of this company, that we have been at pains to do so in this article in themost impartial and unbiased language we could employ.—London Mining World.

Fuels in the United States.

The product of all kinds of coal in the United States in 1893 was 162,814,977 long tons, or 182,352,-774 short tons, valued at $208,438,696, against 160,-115,242 long tons, or 179,329,071 short tons, valued at $207,566,381, in 1892. The increase in 1893 was 2,699,735 loug tons, or 3,023,703 short tons, in quantity, hut owiug to a decline in the price of bituminous coal, the result of over-production during the latter part of the year, the value increased but $872,315. The product in 1893 consisted of 48,185,306 long tons, or 53,967,543 short tons of anthracite coal from Pennsylvania, an increase from 1892 of 1,334,-856 long tons, or 1,495,039 short tous, and of 114,629,-671 loug tons, or 128,385,231 short tons of bituminous (including scattering lots of anthracite from Colorado, New Mexico and Virginia), an increase over 1892 of 1,364,879 long tons, or 1,528,664 short tous. The value of Pennsylvania anthracite increased $3,245,078, the average price, in spite of the industrial depression, advaucing from $1.92 to $1.94 per ton. The value of bituminous coal decreased $2,372,-763, the average price declining from 99 cents per ton iu 1892 to 96 cents in 1893. In statiug the value of anthracite the marketable product only is included; that is, the amount of coal used at the collieries, which is merely eulm or slack, which would otherwise be wasted, while included in the product, is not included in the value. This item of colliery consumption in 1893 was 4,016,709 long tous, or 4,498,714 short tons. The value of bitumiuous includes all grades of coal produced except what is thrown on the dump aud neither sold nor used.

The total product of coke in the Uuited States in 1893 was 9,460,310 tons, as compared with 12,010,829 tons in 1892. This great reductiou is due to the depression in the hlast-furnace industry. Coke-made pig iron in 1893 was 5,390,184 tons as compared with 6,822,266 tons in 1892, and pig iron made with anthracite and with mixed anthracite and coke aggregated 1,347,529 tons in 1893 as compared with 1,797,113 tons in 1892. This would account for a reduction of about 2,000,000 tons of coke. The remainder of the decrease is due to the falling off in demand at foundries and other works where coke is used. Pennsylvania is still the chief coke-producing State, contributing 65.8 per cent of the total, and Alabama is second, contributing 12.2 per cent.

The chief features of iuterest in 1893 in petroleum were: 1—The great decliue in production of the older fields and the increase of the newer. 2—The decline in stocks held at the wells. 3—The increase in price. 4—The increase in exports. 5—The success in refining limestone oils. Pennsylvania declined from 27,149,034 barrels of 42 gallons in 1892 to 19,283,122 barrels in 1893. Lima, Ohio, fell off from 15,169,507 barrels in 1892 to 13,646,804 barrels in 1893. On the other hand, the production of West Virginia increased from 3,810,086 barrels in 1892 to 8,445,412 harrels in 1893. Indiana increased from 698,068 barrels in 1892 to 2,335,293 barrels in 1893. The total product for all States declined from 50,-509,136 barrels in 1892 to 48,412,666 barrels in 1893. The year 1891 marked the highest output, it being 54,291,980 barrels. This was the year of the remarkahle product of the McDonald field in Pennsylvania. The average value of certificate oil in the Pennsylvania fields was 64 cents a barrel as compared with 55⅝ cents in 1892, an increase of 8⅜ cents. The price of Lima oil advanced from 36⅜ cents in 1892 to 47¼ cents in 1893, an increase of 10⅞ cents. The total exports of petroleum in the calendar year 1893, including crude, refined and residuum, was 804,221,-230 gallons, the largest export recorded, and an increase of nearly 60,000,000 gallons compared with 1892. All forms of oil, except luhricating oil, shared in the increase. The consumption of natural gas is limited more and more to domestic use. Only in Indiana has consumption increased for manufacturing purposes. Another feature in the situation is the increase iu price to consumers. The total value of the product in 1893 was $14,346,250; in 1892, $14,-800,714.

People who want to prospect for oil in the new district in the city of Los Angeles must obtain a permit from the Fire Commission before beginning operations. The City Council has adopted an ordinance regulating the operation of oil wells in the city limits.

The Day of Small Things.

This is the day of small things in gold mining says the *London Mining Journal*. A quarter of a century ago anything less than an ounce to the ton was usually regarded as unprofitable, unless the surroundings of the property worked were exceptionally favorable to cheap production. It was then a question of "How many ounces to the ton?" Now we ask "How many pennyweights will it yield?" Of course, we are speaking of quartz mining, for in working huge alluvial deposits, "pennyweights" to the load open up vistas of wealth which only distant—very distant—and inaccessible fields venture to promise. In placer mining the calculation of cents is iudulged in, and one mine in New Zealaud pays on a yield of a grain of gold to the yard. The cost of treatment averages 1½d. per load, and the other ½d. furnishes a handsome dividend to those interested in the property. Labor-saving machiuery, the utilization of Nature's ample resources in the shape of water, the skill of the hydraulic engineer, the advance of science, and last, but not least, the application of carcful business principles in the management of gold mines, have all tended to bring about these results.

Many years ago the late Sir Waringtou Smyth ventured to predict that if the quartz reefs of Wales would yield eight ounces to the ton, they might with economical management be made to pay a substantial return on the money invested in their development, but Professor Crookes is well content with as many peunyweights, though his recent average at Cefn Coch has exceeded one-half ounce to the ton. The Alaska Treadwell property mines, mills and otherwise treats low-grade ore at a cost of 6s. per ton, and auother property, worked on a smaller scale with Huntiugton mills, finds a gold return of 2s. 6d. per ton profitable, the whole cost of mining, treatmeut, and management being covered by 2s. 3½d. per ton. As we said at the commencement of our article, this is the day of small things, aud as even with the greatly increased production there is still a dearth of gold, it would he well if the attention of miners and capitalists reverted to some of the fields long since discarded, but which, when worked under old conditions, failed to pay because they yielded only pennyweights and not ounces to the ton. The old-fashioued gold miner was a man in a hurry to be rich, and with little capital, and less skill, he was ever ready to discard one field, and hetake himself to pastures new, in the hope that a few months labor would euable him to spend the remainder of his days in that luxurious ease which wealth is supposed to ensure. There is still a good deal of the old leaven left in the gold miner's composition, as is evidenced by the rush to Western Australia during the last two years. It must he acknowledged that the returns and reports from that country are almost fabulous, hut for some time to come the yield per ton must be large in order that, with the difficulties attendant on working in the new fields, the production of gold may prove a profitahle undertaking. There the day of pennyweights has not yet begun, though as the ore is easily treated, and, supposing that the gold is not confined to rich shoots which, with the present limited experieuce, seems to he the case, there is no reason to doubt that in the future the calculation of pennyweights may deserve attention in Western Australia.

The question we are desirous of asking is. Which is the hest for the world—the age of ouncces, or the age of pennyweights? Gold, in our present commercial system, is a necessity, and the greater the production the sooner will the vexed problem of the currency standard be solved. But there are other aspects worthy of consideration besides currency. There is the industrial aspect. The treatmcnt of low grade ores creates a demand for labor and extensive machinery and plant, and by this the question of the amount of unemployed labor in the world is affected in a dual sense. First, miners are required for the production of the orc, and secondly, the iron, steel and mechanical trades are requisitioned for the provision of material and machinery. The high grade gold field usually concentrates wealth in the hands of a few—the low-grade field has the effect of distributing prosperity among the many. Low grade mining is essentially an industrial enterprise, and is far reaching iu its effects upon other industrial undertakings. From a purely industrial point of view, therefore, the day of peunyweights is rather to be welcomed than despised, and the resumption of work on discarded low-grade fields, which is now taking place in many of our colonial possessions, is a healthy sign in the industrial world.

The Alaska-Treadwell gold mine paid $450,000 in dividends last year on ore which milled $3.20 per ton. The total cost of working 220,043 tons was $1.35 per ton, leaving a profit of $1.85, which interest and store profits brought up to a total of $1.95 per ton.

The Report of State Mineralogist J. J. Crawford is now in the hands of the printer at Sacramento, and will probably be ready for distrihution in ahout a month.

country, in their best days. And the problem of the profitable reduction of low-grade ores is one of great and intense interest to that wonderful camp. It is being studied steadily. The solution will be the increase of the camp's product by millions of dollars. Such a problem was scarcely considered even, in the first days of the great silver districts; hence the general direction of attention to gold mining has tended toward economy. It has caused the saving faculty to be more generally exercised, and the saving art to be more diligently practiced.

Leasing has naturally become more general in the hard times. Mine owners who could not see just how they were to make profit by working their properties themselves, have been willing that others should take the chances on leases. Many miners thrown out of employment have seen no way to make livelihoods for themselves and theirs except by leasing. That, indeed, may have been no great and tempting opportunity, but it was a chance, and few chances are left unimproved in these times; thus leases have become unusually numerous. Men working for themselves, and dependent directly upon the product of their labor for their incomes, are ever more economical than those working for others and sure of their wages. And then work on a small scale is usually more economically conducted than on a large scale.

The untowardness of the times has also caused more work to be done for product and less for development, for men have been forced to have immediate returns. It has directed invention more earnestly to the devising of methods for the reduction of low-grade ores, and good results have already been achieved in that direction. We hear often of processes that promise to make ore valuable which was hitherto worthless. The working of mines, before neglected, has not unfrequently led to the finding of large deposits. Thus from our very misfortunes have come results that promise to be of lasting good to our State, that seem to assure a material increase in her product of wealth.

The Effect of Heat on Tool Steel.

The discussion brought on by the presentation of Professor Bristol's paper at the Montreal meeting of the American Society of Mechanical Engineers seemed to show that it is by no means as thoroughly understood as it might be, that it is much easier to bend or straighten a piece of steel when it is at a temperature of 200 degrees to 400 degrees than when cold, and that a piece of steel which will certainly break before taking the desired amount of permanent set when cold, may frequently be bent with very little danger of breaking when heated to a temperature considerably below that required to draw the temper.

File makers recognize this when they straighten files while still hot from the tempering bath; files which we all know cannot, when cold, be given the least permanent set without breaking.

Every tool maker is familiar with the fact that a reamer, sprung in hardening so much that it will not true up in the grider, can usually be readily straightened in the screw press if scoured, and then heated until it just begins to show color again. This is a common operation in tool rooms, and has made familiar to toolmakers the principle involved. The case mentioned by Mr. George R. Stetson, in which it was found that steel bars moderately heated broke more easily and with more regular fracture, instead of being an opposite experience, as might be supposed, is a confirming one, showing that the moderate degree of heat applied simply allowed the molecules of the metal to move upon each other more easily, and, by relieving internal strains and reducing the internal structure more nearly to a normal condition, caused the fracture to take place more nearly upon the line called for by the stress imposed upon the bar. In other words, while the fracture of a cold steel bar by transverse stress is usually modified in form by internal stresses existing in the bar, the application of a moderate degree of heat, even as low as 212 degrees, is sufficient in some cases to so far relieve these internal stresses as to make the fractures noticeably more regular in form.

It was evidently difficult for some of those who took part in the discussion to get rid of the idea that a change of temper (using the word temper in its ordinary sense) was thought by Mr. Almond to have taken place in the steel wire by passing it through a bath of boiling water; the vital point in his process being, however, that the wire is coiled while hot, and he did not claim that if allowed to cool again before being coiled it would coil easier or with less danger of breakage.

As a matter of fact, however, we doubt that there is a sharp dividing line between a heat which draws the temper of steel and one which does not. We are accustomed to regard 430° F. as about the lowest temperature which effects the temper of tool steel; but this notion probably arises from the circumstance that this is about the temperature at which temper color begins to show upon the steel, and it is quite possible that temper is affected by temperatures considerably lower—even as low as 200° F., only we have no means of readily detecting the change.—American Machinist.

Shasta County Mines.

REDDING, Shasta Co., Oct. 18, 1894.

TO THE EDITOR:—The mines of Shasta county seem to be more than holding their own. The Uncle Sam at Squaw creek has the usual force at work, and drops thirty stamps steadily. The bullion shipments vary from thirty to forty thousand dollars a month. The mine and mill are admirably managed and no hitches occur there. The Riley mine adjoining, owned by Messrs. Morton and Bliss of New York, is having the lower works timbered and the tunnels cleaned out. It is understood that an examination is to be made by a New York expert, and if the report is favorable the mine and mill will resume operations. Work on the Clipper and Snyder has been temporarily suspended. The Balla Callela and Windy Camp properties have cut their force to three men and the mill that was to be erected is now a thing of the misty future. The Iron Mountain runs twenty stamps and mills from ninety to one hundred tons of gossan ore daily. They are working a small quantity of sulphide ores, but the large per cent of copper makes it difficult to handle them in an amalgamation plant. The Minnesota mine on Spring creek is working but two men at present. Bullard and Van Devere are working three men on Flat creek and will start the arrastra this week.

At the Old Diggings district the Texas and Georgia have struck a rich pay chute; the chute has yielded about $42,000 in the last six weeks. A large payment has been made on the mortgage, and the present outlook is favorable for the property to yield fair dividends. The rich ore is shipped to Selby's, and the low-grade worked in the twenty-stamp mill. The present strike is in one of the lower ore chutes, and about 300 feet from the surface, and not 900 as reported. The Central has put a force of men at work under the management of Mr. Anthony. The Walker mine can boast of having the longest grass-root tunnel in the State. They have been two and one-half years running a tunnel 1240 feet long to cut their ledge forty feet below the bottom of the shaft, a total depth of about 164 feet from the surface. They have eighteen to twenty feet of high-grade ore in the ledge, and could have accomplished in two weeks what it has taken two and one-half years to do, saying nothing of the expense.

At Rich Gulch Major Lyons is about ready to resume operations on his claims. His mine suffered from the long-tunnel disease extending over a period of two and one-half years, when a shaft would have demonstrated the value of the property in two months. The syndicate of Poles who bought the Quartz Hill property are running ten stamps at the old Calumet mill on the river. They are doing some queer mining from a California standpoint. They have a pay streak from four to seven feet wide, and are working it from the top as an open cut. Some very rich bunches of ore are found; the ore averages about $6 per ton, according to the best information obtainable.

At French Gulch the old Myers property, under the management of Prof. Morton is making a fine showing. The ore is very rich free milling and their bullion shipments run twelve thousand a month, with twenty-five men employed and a four-stamp mill. The Gladstone is still closed. The new ten-stamp mill on the Wheeler will start next week. Messrs. Hunt and James got a twenty-horse power hoist on their mine near Whiskytown this week, and now handle the water in their shaft. Mr. Lewin reports the Washington property sold to a New York syndicate, headed by a Mr. Delano. Muletown keeps a small quartz mill running. The ore averages $25 per ton. Boswell has a ten-ton lot ready for shipment to Selby's which goes over $200 gold per ton. Bullyeboop is running about four tons a day through the wet chlorination mill. Four hundred cords of wood have been piled up around the mill for winter. Ditches and flumes are being put in order everywhere for winter. F.

The Tule Canyon Gold.

TO THE EDITOR:—The information you publish, taken from the *Silver State*, is a little behind time, and the Tule Canyon mines are no more "dry diggings," as the Summit springs are supplying water for sluicing the gravel in the upper part of the canyon, from the fork down to Robinson's store, a distance of about three miles—the principal part of active operations. Besides the springs, plenty of water can be reached by sinking to the bedrock, from twenty to seventy feet, or perhaps more.

The pay dirt averages two feet in thickness; the gold is coarse and worth $14 per ounce. Nuggets to one-half of an ounce in size are not uncommon. The largest I have seen during my stay there was three and one-fourth ounces. In January, 1892, there were about forty white men in the camp and about twenty Chinese. The Chinese had some claims leased—very few purchased—and were doing well. They have a Chinese supply store, but many prefer trading with white men. Both live together harmoniously. The miners were not very industrious, and took it easy. They make good days' wages by working on short shifts, striking frequently small rich pockets, resulting in handsome profits, such as $50 to $400 in a week's cleanup.

There is a good field for prospecting, as more than two-thirds of the gulch is yet undeveloped; but it requires some capital, because the dirt has to be hoisted and pumping is unavoidable. The gulch is about nine miles long, opening into the desert. The highest point—the summit—is 7620 feet and the mouth 4340 feet above sea level. Wood and timber are abundant.

Tule canyon is situated in the extreme southwest of Nevada, Esmeralda county, on the California State line (Inyo county), and at the head of Death valley, and can be reached by the C. C. R. R. from Carson City to the Mound House, to Candelaria, then by stage (twice a week) via Columbus, Fishlake, Palmetto, Pigeon springs to Lyda valley, about seventy miles staging; hence four miles more of good wagon-road. The accommodation is good. The Tule Canyon camp ever has been and is yet a sort of indolent concern. The miners make their living and seem not to care for anything more. Bob Robinson's store furnishes bacon, beans, tobacco and whisky in exchange for gold-dust, and nothing more is wanted. There is no hotel, no restaurant, no barber-shop and no saloon.

The Tule Canyon district has also strong, promising quartz ledges, but very little prospecting has been done on them. More attention was paid (1890–1892) to base metal veins. Several rich pockets were extracted and a couple of hundred tons of ore were shipped, rich in silver, but poor in gold. I. B. STORCH, M. E.

Working Phosphate Deposits.

A correspondent of *McPherson's Geological Record* says: The increasing demand for phosphate as a fertilizer gives special importance to all minerals of this class, phosphoric acid being an article of plant food which perhaps above all others should claim the farmer's most careful attention. It is absolutely necessary to the life and growth of plants. The soil is therefore very speedily exhausted of its supply and it behooves the farmer to carefully and continually return phosphoric acid to his soil, lest it become barren through want of this ingredient.

Peruvian guano, which in addition to phosphoric acid contains nitrogen, has been used in nearly every agricultural district in the United States and Europe. Also shell marl, which generally contains a small percentage of phosphoric acid, has been used in England for many years. In 1845 Professor Henslur recommended Cambridge coprolites or nodules, since which time deposits have been discovered in Norway, Russia, Germany, France, Spain and many other countries.

In 1867 the South Carolina deposits began to be worked, and in four years' time the annual production of land and river rock had reached 65,000 tons.

Although the existence of phosphate deposits in Florida had been known for many years, no regular shipment was made until 1888, since which time this industry has assumed vast proportions, and many millions of dollars have been invested in lands and machinery to carry on the business of mining. It is very difficult to define the area containing phosphate in Florida, as there is scarcely a county in the west half of the State where it does not exist either in the form of pebble rock or soft phosphate. In many places it is found near the surface covered with a slight overburden of sand, and in other places the rock crops out on the surface. These deposits seem to occur in a series of pockets. The contents of these pockets consist of phosphate rock in a variety of types, and are irregular masses weighing from a few pounds to many hundreds of tons. The laminated rock is very hard, more or less distinctly compacted in layers, sometimes with intersticces between the laminations filled with sand or clay. The streaks are of a white and salmon color in alternation; sometimes the salmon is replaced with a blue. The lamination illumination can in most all instances be distinctly traced. This last type is frequently found imbedded in clay. The lamination conchoided type is a hard boulder, smooth with polished exterior, solid and massive within, color cream white with irregular streaks of a darker color.

The land pebble is found mixed in with the sand and yields in many cases seventy-five per cent of pebble, the matrix in some cases being a white phosphatic clay showing as high as fifty per cent phosphate of lime.

There are many other types found throughout the State, but those named are the most frequent. The first three types named are in nearly all cases found in pockets, and have in a number of cases been worked to a depth of sixty to ninety feet. Most of the pebble deposits are found within a few feet of the surface, and in many cases I have found it over an area of several miles in extent. The mining of phosphate in Florida at the present time is one of the best paying investments in the State. Thousands of tons are shipped to England and Germany, and eventually Florida will supply the world with fertilizers.

Scientific Progress.

Aids in the Determination of Color Blindness.

A number of specially interesting cases of color blindness are dealt with in a recent article in the *Zeitschrift fur Instrumentknnde*, and conclusions are deduced tonching the diagnosis of color blindness, the classification of subjects so affected, and the system of color perception or the theory of tbe sense of light. For diagnostic pnrposes the use of the varions self-coutrolling methods are recommended, and proofs are addnced of the nnreliability of Stilliug's psendoisochromatic tables. Tbe anthor discnsses the following seven methods of examination: (1) spectroscope with micrometric adjnstable collimator-slit; (2) colored samples of wool; (3) colored pigment papers; (4) the objective spectrum; (5) colored flames; (6) tinted glass and combinations of gelatine sheets; (7) Stilling's tables. The resnlts obtained from the examination of ten cases (including snch special cases as hereditary, monocular and partial color blindness limited to the middle portion of the retina) give certain grounds for the statement that, as regards their color perception, human beings may be classed as acbromates, dichromates and polycbromates. Color-blind people shonld not be classified nnder snch simple conventional rnbrics as "red-green blind," etc. Sbould one color be wanting, observes the writer, it is not necessary that the counter-color should also be lacking; marked "displacement of complimentarism" often occurs. (In the above mentioned cases of color blindness, red and blne were complimentary.)

The anthor goes on to show that, in the strict sense of tbe word, tbere are no homogenons colors (provided that homogenons light is regarded as consisting in reality only of the rays of one wave length) for, on employing the nsual media for decomposing white light (prisms or frame and slit), a snperposition of the individnal wave lengths arises owing to the dispersion, and to the marked breadth of the slit in comparison with the size of the wave lengths. The inference drawn from this is that a marked sensitiveness of the eye to color is not caused by any one wave length, but by a certain kind of combination of several wave lengths. This, therefore, does away with the common idea of making pnrple an exceptional color. Purple is uot preseut in the spectrum as red and violet, being sitnated at the euds of the spectrnm, are not able to superpose their wave lengths; but if these uo longer visible (ultra?) red and violet rays be bronght to convergence, purple will result; and, on the other hand, if we gaze tbrongh a prism at a dark object on a light ground, one of the object's edges will be bordered with red-orange yellow, and the other with blne violet. Green, however, is conspicnous by its absence, as no snperposition can now arise between blue and yellow. Hence pnrple is just as much, and in the same sense, a component part of white light as every other color.—Opticiau.

Electric Registering of Chemical Action.

A novel use of electricity, wbich has been described to the French Academy of Sciences by M. J. Garnier, is that of keeping watch over certain chemical operations and reporting the successive stages reacbed. A mixture of nickel oxide and wood charcoal, for instance, was placed in an earthen tube, closed by two plugs of soft steel pressing against the mixture. The plngs were then connected up to an electric circuit, and the tube was heated in a small reverberatory furnace. The electrical resistance, at first high, gradually sank to zero, then began to increase, and finally became very high; the decrease in resistance, it is explained, being due to the gradnal reduction of the metallic oxide by tbe carbon, the completc rednction being indicated by the minimum resistance, and the final change resulting from the taking up of free carbon by the metal. In the commercial refining of metals it seems to be possible, by a convenient arrangement of ammeters and voltmeters, to determine tbe condition of the contents of a furnace at any moment and any distance.

Magnetic Properties of Asbestos.

Mr. A. C. Swinton writes: "In some recent experiments Mr. J. C. M. Stanton and I found that, employing a very strong electro-magnet, a piece of ordinary white asbestos mill-board, about 4x3x1-16 inches in size, and weighing one-half onnce, was easily lifted throngh a vertical distance of one and one-half inches, and when in contact with the magnet pole the asbestos board wonld support four onnces in addition to its own weight. Lnmps of hard asbestos, snch as are nsed in gas fires, as also pieces of soft asbestos cotton packing, were also strongly attracted, and when some of the latter was placed on the magnet pole and the cnrrent turned on and off, the individual fibers conld be seen in movement. Further, it is quite easy to permanently magnetize a piece of asbestos mill-board, when it will behave exactly as a magnet both in attracting and repelling a compass needle. The principal constituents of asbestos are stated to be magnesia, silica and alnmina, witb some oxide of iron. No donbt it is to the presence of the last-named snbstance that the magnetic qnalities are due. White asbestos is, however, nnderstood to contain bnt small traces of iron—mnch less tban the colored varieties—and consequently the degree to which it is magnetic seems surprising. In any case it may be well to warn experimentalists that asbestos is not a suitable substance to employ in connection with delicate instruments where any nnsuspected permanent magnetism might be prodnctive of serions error."

Germ Life in Ocean Depths.

Recent investigations of the chemical and biological condition of ocean water at great depths have gone far to supplement the work of the Challenger and similar expeditions. The Plankton expeditionary investigations proved tbat germ life capable of reproduction exists everywhere except at tbe greatest depths, being more prolific in the Canary, Florida and Labrador waters than in the nortb or sonth equatorial currents. Bacterial life has been fonnd at depths of 1300 to 3500 feet; and, cnriously enongh, the major portion seems to be of species requiring oxygen for their existence, a great number of which are phosphorescent. Mons. Delebecque has fonnd tbat in lakes tbe quantity of magnesia is constant at all depths and in all seasons, the supply being derived from the abrasion of the beds of rivers draining into inland lakes. Dnring the snmmer season micro-organisms are met with in abnndance at great depths, whereas they are present only in small numbers at or near the surface. Mons. Boutan has also been engaged in researches by which he has obtained photographs of animal and vegetable life at considerable depths, and these photographs are of great valne, as it has been found that living organisms found in deep waters cannot be brought to the surface for examination without a complete change taking place in their characteristics.

THE telephone seems destined to play an important part on the battlefields of the future. Experiments were recently made witb a bimetallic wire, made up of a core of steel snrrounded by a coating of copper. Reels carrying 10,000 feet of this wire can be easily carried by soldiers as a part of tbeir eqnipments. The entire apparatus necessary for a line one mile long can by the use of this wire be made to weigh only five and one-half ponnds. The iufinite and valnable nses to which snch an instrnment conld be applied will be obvious to every one.

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Mechanical Progress.

Electricity for Motive Power Purposes.

At the Belgian meeting of the Iron and Steel Institute a paper was read by D. Selby-Bigge on the applications of electric power, with special reference to works driven by electricity in Belgium. Particulars were given of the cost of production and distribution per unit of power delivered to consumers by different companies, and the author summed up the main advantages to be derived from electric driving in works as follows:

1. The concentration in one highly economical plant of the generation of power for the whole of the works, and great reduction in coal consumed per unit of work done.
2. Reduction in wages, owing to the very small number of officials required in connection with such a plant.
3. Transmission of the energy generated, with very trifling loss, to the different parts of the works.
4. Absence of main shafting, countershafting, pulleys, bearings and belts, and heavy cost of upkeep in connection therewith.
5. Absence of long lengths of steam pipes, and losses due to coudensation.
6. Absence of scattered and separate boilers.
7. Absolute control over the economical running of the works, owing to the self-indicating nature of electric motors and the immediate detection of any undue losses which so often occur in mechanical forms of power transmission.
8. Great economy in work of an intermittent nature and varying loads, a direct proportion between the indicated horse power of generating engine and work given out by motors being obtained.
9. Very small cost and size of foundations involved in works driven electrically.
10. Great facility for alterations and extensions, without any modifications being necessary to the original plant.—Manufacturers' Gazette.

Soldering Glass to Metals.

A process has been devised by some ingenious Frenchman whereby glass may be securely soldered to metals. It is said to be exceedingly valuable from its simplicity and the many important uses to which it may be put. The portion of the glass tube or other article that may be soldered is first covered with a thin layer of platinum. This deposit is obtained by brushing over the slightly heated glass a natural chloride of platinum, mixed with essential oil of chamomile. The latter is slowly evaporated, and when the white and odoriferous vapors cease to be given off the temperature is raised to a red heat; the platinum is then reduced and covers the tube with a layer of bright metal. Placing the metalized tube in a bath of sulphate of copper and connecting the tube to the negative pole of a battery of suitable energy, there is deposited on the platinum a ring of copper which will be malleable and very adhesive if the operatiou has been properly performed. In this state the glass tube, topped with copper, can be treated like a genuine metallic tube and soldered to iron, copper, bronze, platinum, or any other metal that can be united with the solder.—Age of Steel.

Steam Carriages.

Progressive France is ever doing its utmost to encourage the advaneement of science. Just now that country is much absorbed in the question of the propulsiou of carriages without horses. Recently a competition for prizes was held in Paris for the purpose of drawing out the results of the labors on self-propelling vehieles. A large number of carriages were entered, representatives of nearly every class of this sort of coutrivance being brought forward. The trials were for speed, comfort and utility. A long course over ordinary roads was laid out, and over this each contestant drove his machiue. Speaking of the results of the contest, the *Spokesman* says:

Vehicles driven by steam or petroleum made the ninety miles between Paris and Rouen over the carriage road recently with success. It was shown that, for certain purposes, and on roads of a certain degree of excellence, the horse is not the best motor. The steam carriage of the Count de Dion, carrying four persons, attained a speed of seventeen miles an hour, and averaged about ten miles an hour. A petroleum motor took the second plaee. The race has caused much attention to be given to improvements in the construction of vehicles of this kind. It is seeu that they are far from perfect. In appearance, as well as design, they need the development that can be obtained only by extended use. Carriage road motors have long been in use in this country and in Europe where roads are suitable, but their imperfections have not been sufficiently attended to. As at present made in England and Germany, road motors have broad tires and do not injure the roads. On the contrary, they are believed to benefit them, since they act like rollers in smoothing the surface.

The Essential Ideas of Most Foreign Rifles of American Origin.

Some time ago we published the statement that the German Mauser rifle was an American invention, and we are uow asked as to our authority for that statement, says the *Army and Navy Journal*. Those familiar with the facts are aware that Mr. Mauser, at the time the weapon having his name was invented, was a skilled mechanic in the employ of E. Remington & Sons, Ilion, N. Y., and that the first Mauser gun was constructed at the expense of the Remingtons, and uuder the supervision of their master mechanic. The Remingtons had an interest of one-half or more in the invention, but Samuel Remington, who for many years represented the company in Europe, had sueh an unfortunate experience of the German government's illiberality to inventors that he sold his interest in the gun to Mr. Mauser for $500. These facts fully justify our statement, referred to, that the Mauser is an American invention. The Lee rifle furnishes the essential idea of most, if not all, of the rifles now in use in European armies, with the exception of the improved Chassepot or Gros. It certainly exeites surprise in the mind of any one who is familiar with the history of small-arm invention to find our Government going abroad for its service weapon.

The kingdom of Swedeu and Norway, from one of whose subjeets we obtain our new army rifle, was the first foreign Government to adopt aud purchase an American breech-loader, the Remington. With proper encouragement from the Government our small-arm manufacturers might hold the field against the world. The design and essential idea of the breech-loader and magazine gun, wherever it is fouud, is American. The machinery used in the manufacture of modern arms in all foreign countries manufacturing their own arms is of American invention and in a large measure of American manufacture. The machinery in the armories of Germany was manufaetured at Hartford, Conn, and the German workmen were instructed in its use by Yankee mechanics sent to Germany for one or more years.

An electrie brake has been in use on a car of the Suburban Railroad Co. of St. Louis for several months. Its eonstruetion is a hollow magnet, made of coiled copper wire. In the middle, and free to move lengthwise, are two pieees of soft iron, the opposite ends of whieh are eonnected with the brake levers. When the coiled wire is energized, the two soft iron cores are moved toward each other and the brakes are applied. The brakes may be applied with full force at first, and let off gradually as the car stops.

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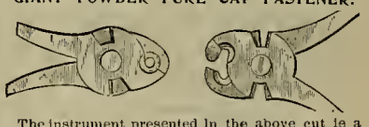
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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO.—Amador *Republican:* The Volcano Gold Gravel Mining Company intend to do something in the way of quartz mining. They have purchased a quartz claim on the Blakely ranch, situated between Volcano and Pine Grove, and have commenced the erection of hoisting works thereon. Seven men are employed. The property was prospected to a limited extent in early days, but has remained idle for many years.

A large number of new blocks have been placed alongside of the flume of the Volcano Gold Gravel Company's claim in Volcano basin, in readiness to be placed in position in the flume. This indicates that the property is to be worked to some extent the coming season, notwithstanding all the reports to the effect of its permanent suspension on account of the exactions of the debris commissioners for the construction of works for impounding tailings.

A man named Smith has bonded twenty acreas of the Clough ranch, near Volcano, for quartz mining purposes. The price is reported at $3000, one half of which has been paid. It is the intention to erect a ten-stamp mill, which even though the rock on the Clough ground should prove inadequate to keep it in steady operation, ought to prove frialy profitable for custom work.

The tunnel of the Clinton Consolidated mine at Wieland is being cleaned out. Negotiations are in progress for the sale of the property to a New York company.

Henry Zumalt recently had a quantity of of rock from his mine in Pioneer district crushed at the Gracey mill. It yielded, we are informed, nearly $10 per ton in free gold alone.

Freeman Clark has also had a crusbing of ore from his mine in the same district. We have not heard the result.

At the Hardenburg near Middle Bar everything seems to be moving along in a more prosperous manner than at any time since the present company took hold. The mill is kept running steadily. A winze is being sunk at the 800 level, which is to be put down 200 feet.

THE ZEILA OF JACKSON.—Amador *Ledger:* Repairs are to he made upon the Zeila mill and shaft during the fall but the exact date at which the work is to be commenced has not been decided upon.

THE STARBIRD OF JACKSON.—Work is being pushed forward at the Starbird, formerly the Stewart mine. A force of men are now employed cutting timbers to be used in the development work of the property. The three-stamp mill is kept running continuously.

Calaveras.

HEROLD QUARTZ MINE.—Calaveras *Chroniele:* The outlook for this property is better than ever. The winze from the upper tunnel has been sunk twenty feet deeper, making forty feet in all, and the vein has gradually improved in the quality of the ore. The vein is fully four and one-half feet of ribbon quartz, giving $20 per ton in free gold and carrying two and one-half per cent of high grade sulphurets. Four men are at work sinking the winze, 5x9 feet suffices to extract sufficient quartz to keep the mill crusbing ten hours each day. with two shifts in the lower tunnel about forty feet has been made since our last report, making a total length of 130 feet; 120 feet more is necessary to be run to reach the ore vein at the winze. A new lodging house has been erected on the property. Twelve men our on the pay roll.

Nevada.

MINING AT PHELPS HILL.—Nevada *Transcript:* Charles Phelps has for some time past been running a bedrock tunnel into his gravel mine at Phelps Hill, this side of Washington. He has got into the hill about 100 feet and has just entered the edge of what promises to be a very rich gravel channel. The prospects obtained from some of the gravel are highly encouraging and the indications are that Mr. Phelps will have a very valuable property when he gets his mine thoroughly opened. He intends to drive the tunnel 100 feet fartber, wbich he calculates will about take him across the channel. The gravel in the tunnel is the regular blue gravel. Years ago, before hydraulic mining was suspended, the same mine paid handsomely.

IMPROVEMENTS AT THE FEDERAL LOAN.—The Ingersoll drill and air compressor received here last Wednesday by the Federal Loan Mining Company, were taken to the mine Saturday. The new machine weighs four tons and is of the latest kind. It will be put in place without delay. Chris Weisenburger will do the necessary carpenter work and J. T. Day will lay the concrete foundation for the air compressor. The rock in the above mine is very hard and the machine drill will greatly facilitate operations. In a week or ten days the compressor will probably be in place and the air pipes extended into the mine and everything ready to start the drill to work.

A steam pump has been set to work at the old Live Yankee mine, ou the Grass Valley road, to pump out the water from the shaft. All the other machinery has been put in place and the new buildiug is about completed.

KATE HAYS HILL MINE.—Grass Valley *Telegraph:* It is with pardonable pride that the owners of the Kate Hays Hill mine are exhibiting some specimens of ore which came out of that mine. We were shown several pieces of rock from the 200 level of that once famous mine, and they were studded with gold. In years gone by, when this was a young mining camp, the Kate Hays cut an important figure iu the quartz miues of our district; but it has been idle for years, until lately, when a few enterprising spirits took bold of it and are now going to try to unearth the treasure which is known to exist beneatb tbe surface of that claim.

Plumas.

IMPORTANT MINING OPERATIONS.—Plumas *National-Bulletin:* Mr. A. W. Rugg, who is in several mining properties near La Porte, was in Quincy on business lately. He reported about three feet of snow at Onion valley as a result of the storm. However, it was very soft and fast disappearing.

Mr. Rugg is superintendent of the mining operations now being inaugurated at Cleghorn, on the middle fork of Feather river, about nine miles below Onion valley. He recently interested a number of San Francisco and Eastern capitalists with himself in au effort to develop a big mining property at the point named, and the necessary machinery, provisions, etc., are being laid in for the winter. They are now building a road from Onion valley down to tbe mine. The mining ground now under control of the company embraces about seven miles of the river bed and bars adjacent thereto.

It is the intention of the owners to prospect the gravel deposits by means of shafts at different points. For this purpose a large centrifugal pump, steel-lined, and with a capacity of 700 gallons per minute, has been ordered and is now en route; also two 22-horse power engines.

If the prospecting should result satisfactorily, a large, permanent mining plant will be put in next season and operations conducted on a large scale, employing a large uumber of men and making a lively camp of it.

Mr. Rugg is very favorably impressed with Plumas and Sierra as mining counties, and he thinks tbe industry is in its infancy yet.

Shasta.

NOTES.—Redding *Free Press:* It is stated that out of 600 feet of flume on Clear creek the Chinamen have taken out the enormous sum of $35,000 in gold.

Lowry, tbe old-time pocket-hunter, is reported to have found on Jackass flat, near old Horsetown, a nugget valued at $900. It was found in tbe gravel and a large piece of white quartz was adhering to it.

Mr. Chapman, below Horsetown, is bringing a line of pipe over 4000 feet in length across Clear creek from the Igo ditch, to work his claims. A house bas been built and other improvements made at Texas Springs preparatory to a winter's washing.

On Oregon gulch the shaft and incline being sunk on the contact between the sandstone and slate has now attained a deptb of 250 feet, with some 200 feet of a drift. Two feet of the blue gravel was found last week that paid a dollar to the pan. The gold was coarse and covered with a black coating. The promoters are jubilant over this find.

Mr. Marton, on the Igo road. four miles west of town, has buildings erected and wood cut for a winter's prospecting. He contemplates putting up a steam hoist and sinking 300 or 400 feet.

On Miller's ranch, at Lower Springs, Wm. P. Miller is hauling ore to his mill on Middle creek. Ore is also being bauled to the Hartman mine, owned by the same parties.

Jim Salee's men, at the Old Spanish mine at Upper Springs, are making good headway. Three shifts are at work and the 100-foot level sbows up fine. The ledge averages over four feet and all pay ore.

At Quartz Hill the open cut work being done is proving a source of considerable annoyance. The heavy rains deluge tbe workings, and the mine will have to be roofed over if the winter is a wet one. The mill is kept running steadily.

At Old Diggings, R. G. Hart reports his bonanza in tbe Texas Consolidated as still showing up fine. Great things are expected from this ore body. It is asserted that tbe Uncle Sam won't be in it with the Texas.

Tbe Central owners now propose to push development on their mine and to try and rival the Texas Consolidated. Mr. Anthony is kept busy getting timber and material for the winter.

At Iron Mountain, Mr. Hartman put four men at work on bis gold claims, and will start his arrastra.

The Lost Confidence mill is running through about eighty tons of ore as a daily average. Wood is being got in as fast as possible for a winter's run. The wood consumption is eighteen cords daily. They have 15,000 ounces of bullion ready for shipment; it is about one-third gold.

The Gladstone has been making efforts, througb its superintendent, Mr. Gray, to patch up the differences witb creditors and assume operations.

At Whiskytown, Hunt and James got the twenty-horse power engine of Sam Hill and put it to work bailing out shafts.

Peter Scberer's Tellurium and Cleveland ore is standing idle at present.

Mr. Samona, at the Gem, is getting ready for another winter's run. He proposes washing the entire top of the cave off and then milling the ore. The caved material is over seventy-five feet deep.

Siskiyou.

BALDY MOUNTAIN.—Yreka *Journal:* Baldy mountain is coming to the front as a mining camp. There are ten men at work, seven in the Columbian mine, operated by the Columbian Mining Co., and three in the Mabel mine, owned by W. A. Chamberlain. The Columbian mine has been in operation one year. They bave one tunnel in over 200 feet, besides two others in progress. They crushed 150 tons of quartz in the Scott Bar mill that went $12 per ton, and are now putting up a five-stamp mill on Mill creek, expecting to commence crushing by the first of next month. Chamberlain bas started a new tunnel on the Mabel mine, which will strike the ledge in about seventy-five feet, when he will have 300 feet of ore above the tunnel and liable to follow on the ledge tbe full length of his claim. Its vein is from one to ten feet in width, and is traceable tbree miles. The Columbian mine is on the soutb end of the ledge, the Mabel north of the Columbian, the Little Wonder north of tbe Mabel, and another claim north of the Little Wonder. Baldy mountain is on the divide between Mill creek and the Klamath river, nine miles from Scott Bar and eight miles from Oak Bar.

EMPIRE.—The Empire quartz ledge, near Honolulu, on Klamatb river, is now being worked under the management of the Garvey boys, and Frank Hegler superintends the quartz mill with prospects of good success. The mine now shows a ten-foot ledge, the quartz indicating the certainty of yielding from $10 to $15 or more per ton. Tbis ledge is likely to prove the most extensive in the county and to be of great benefit to this section, by giving employment to miners and putting more gold in general circulation.

ORO FINO.—At Oro Fino the Eastlick Brothers are greatly enlarging their ditch in preparing for extensive operations in hydraulic mining when the winter rains and snow storms commence for supplying water. They expect to take out more gold than ever by tbe improvement toward gaining a heavier supply of water for the giants.

Theodore Deming is busy making extensive preparations for successful hydraulic mining at Oro Fino during the coming winter, by piping water from Kidder creek to ground 100 feet higher than is now being worked in that extensive and rich mining district.

Tuolumne.

BEING DEVELOPED.—Sonora *Democrat:* The Carlotta mine near Arrastraville, the property of Wm. Sharwood, is now being developed by him and at present its appearance is very encouraging.

Ed and James Garrett of Bald Mountain, after working and toiling as few men ever toil, struck it rich last week in tbeir mine.

Jack Faxon, who owns the north extension of the Golden Gate mine, is negotiating with an Eastern company, which intends purchasing and putting up a mill. Tbe lead is two feet wide, and certified assays give percentage of sulphurets from 2½ to 3 per cent, and in value from $200 up to $2000 per ton. This is a valuable property.

W. H. Nevils, superintendent of the Gerrymander mine, reports that he bas developed a fine cbute of ore, prospecting well in free gold and assaying high in sulphurets.

The Dead Horse Consolidated mine has resumed hoisting operations, and soon it is expected tbat it will resume general operations. Lack of water bas heretofore retarded its progress.

S. S. Badger & Company, who are mining in the Stanislaus river at Central Ferry, have had very ill luck lately. Last week, after having built a flume fifteen feet long and four feet wide, and after getting down to tbe bedrock wbere the ground prospected well, the rains of Saturday raised the river and broke the flume. The company has spent a great deal of money thus far, and it is to be hoped that its resumption of the enterprise will be attended with large success.

Tbe Green mine, near Sugar Pine, is now being re-opened by Messrs. Ayres & Co. of San Francisco. Last week a rich chute was discovered near the end of the tunnel where it had been capped over with slate. The discovery is one of great value, for it has developed into great width, is very rich and the sulphurets are of a high grade. It will be recollected that this mine yielded $200,000 or more about ten years ago, and because of litigation operations were suspended. No doubt present operations will develop this property until a mine of great and lasting value is established. Present results prove it.

The Scott Bros., formerly of the Black Oak mine, have recently made wbat is thought to be one of tbe greatest discoveries of the latter day developments in Tuolumne. The discovery was made in a lode on Davis Flat, near the north fork of tbe Tuolumne river. The chute is described as being twelve feet thick and showing large pieces of gold across its entire width from wall to wall. It is not yet known bow long the cbute is, but it has already been uncovered a distance of fifty feet, and bids fair to run a long distance yet, as there is no diminution of its gold, its sulphurets and its great dimensions. The gentlemen have already had an offer of many thousands of dollars for the mine.

The shaft in the Rappahannock is down eighty-eight feet and still progressing with undiminished speed. Better than this, the main vein and all attendent matrix is increasing in dimensions and improving in appearance and prospects. It is also given forth by mining experts that this must ultimately become a great property, because, first, it bas fine ore bodies of its own, and, secondly, the ore bodies of the Rawhide mine—the wonder mine of the State—are pitching northerly into the Kappabannock mine. All the buildings at the above mine have been given a coat of metallic paint, and preparations are being made to erect the big mill.

Trinity.

DITCH CONTRACT COMPLETED.—*Journal:* Rouse, King & Co. have completed their contract for the enlargement of the Canyon creek ditch to the Hayes placer mine, Junction City, and, as usual with that company, have done a fine piece of work.

NEVADA.

Washoe District.

SAVAGE.—Virginia *Enterprise:* 950 level—The east drift from the new station is advanced six feet. On the 1000 level in north lateral drift started from the east drift, they continue to extract ore from tbe sill floor upward to the seventh floor. The south drift started from the face of the east drift was advanced ten feet; total length seventy-one feet; face is in clay and porphyry. During the week have hoisted sixty-one cars of ore. Car samples average $23.91 per ton. On the 1000 level the south drift started from the east drift tbirty feet from the south ore stopes they are stoping ore of fair grade. At a point eighty feet north of tbe south boundary, the west crosscut mentioned in last week's letter was advanced twenty feet and discontinued. On the 1100 level east and west crosscuts from the north lateral drifts were advanced twenty-eight and twenty-tbree feet respectively. Each of these crosscuts is in quartz of nominal value. The upraise from tbe west side of the north lateral drift has been carried up fifteen feet, following a stratum of fair-grade ore.

CHOLLAR.—The north drift, 450 level, has been repaired and retimbered for a distance of thirty-two feet since last report.

The north winze, 450 level, bas been sunk eleven feet for the week, and is now down twenty-four feet; the bottom shows a width of nine feet of ore, face samples of which go from $35 to $65 per ton.

We continue to extract a few carloads of fair-grade ore per day from the fillings and ground in places in the old stope on this level.

From tbat and the winze we have extracted during the past week 136 tons and 1700 pounds of ore, which bas been shipped to tbe Nevada mill for reduction, the average battery samples of whicb was $36.55 per ton.

UNION SHAFT.—On tbe 900 level of tbis mine the east crosscut from the north lateral drift, 450 feet northb of west drift, 1520 feet west of shaft, bas not been advanced during the week, owing to necessary repairs being made to the north lateral drift. The west crosscut from the Union Con. soutb lateral drift from west drift, 1520 feet west of sbaft, has been extended 24 feet during tbe week; total length 171 feet; face in clay and porpbyry.

POTOSI.—Have stopped west crosscut No. 5 from tbe soutb drift, 450 level, and started a south drift from main west drift, 550 level, at a point 500 feet west of the shaft.

The winze from the 450 level, 200 feet south of the north line, is down twenty-nine feet; the bottom is in porphyry with a streak of low-grade quartz eighteen inches to two feet wide running througb it.

Little or no progress has been made in the shaft at tbe croppings, due to timbering, etc.

S. N., M. & U. SHAFT.—East crosscut from tbe north lateral drift, 450 feet north of west drift, 1520 feet west of the shaft, 900 level, has not been advanced during the week, owing to necessary repairs being made to the nortb lateral drift.

The west crosscut from the Union Con. south lateral drift from the west drift, 1520 feet west of shaft, 900 level, has been extended 24 feet during the week; total length 171 feet; face in clay and porphyry.

SIERRA NEVADA.—The northwest drift, at a point 160 feet west of the moutb of the Leyton tunnel, is out 128 feet; advanced 41 feet during the week; face in clay, with stringers of quartz through it.

The east crosscut No. 1 from north lateral drift No. 2, at a point 140 feet north of intermediate tunnel, is out 68 feet; advanced 16 feet during the week; face in quartz and porphyry.

CROWN POINT.—There were extracted from openings in the 600 and 700 level stopes during the week 795 tons and 1750 pounds of ore, which has been shipped to the Mexican mill for reduction, the average battery samples of wbich was $9.60, of which $8.62 was gold.

SILVER HILL.—Tbe south drift from tbe winze, 45 feet below the 50 level, and 260 feet southwest from the shaft, has been advanced during the week 12 feet; total distance from the winze 32 feet; the face shows two feet of milling ore of fair grade.

WARD SHAFT.—The west drift from the Ward shaft, 880 level, bas been advanced 13 feet during the week; total length 1160 feet; face in soft porpbyry and clay. The flow of water has nearly ceased.

ALPHA.—During the past week have cleaned out and retimbered 20 feet of the shaft below the 437 level; total depth of shaft cleaned out and retimbered, 417 feet.

BULLION.—The west drift from the Ward shaft, 820 level, has been advanced 13 feet during the week; total length 1160 feet; face in soft porphyry and clay.

BELCHER.—Forty-eight tons of fair-grade ore have been hoisted during the week.

Hawthorne District.

GOLD.—Walker Lake *Bulletin:* W. S. Dickerson brought to town last week a small jar of gold valued at over $400. It was the results of hornings from the Pamlico. James Belzar and Mr. Dickerson are working the mine on a lease and have already taken out several thousand dollars.

Cherry Creek District.

GRIZZLY.—White Pine *News:* The Grizzly mine at Ruby Hill is to start operations again in the near future. We look for Mr. Jesse W. Fox, tbe manager of the company, next week. We are all glad that this mine is about to commence operations, and hope they will find a bonanza, as they deserve it.

Kennedy District.

A SYNDICATE TO TAKE HOLD.—Kennedy *New Era:* J. F. Wardner left here the first of the week, and his destination was unknown to but few, but it now becomes public that he has been receiving overtures from Eastern capitalists relative to forming a strong syndicate to get control of the principal mines of Kennedy district; and in pursuance to letters received last week, he hastened to Salt Lake—selected as a point of meeting—and is now in that city concluding terms whereby the syndicate, with the Imperial group as a nucleus, will begin operations in Kennedy on a gigantic scale and absorb all the smaller fry. The plan decided upon, as we understand it, is to increase the Imperial mill to sixty stamps, build a forty-ton pyritic smelter

and construct a tramway from the mines to the mill. We also understand that J. F. Wardner will continue as manager; and, upon the completion of the deal, and when final arrangements are consummated, which will take some time, he will return in time to rush the improvements to completion before the end of the year. We anticipate that, immediately upon his return, the force in the Imperial will be increased so that an excess of ore will be ready for the enlarged capacity of the reduction plants.

THE HIDDEN TREASURE MINE improves as the west drift advances. The upraise has made connection with the winze from the surface. Men are employed grading a road to the ore bin to allow teams free access. A shipment will soon be made to Salt Lake City.

IMPERIAL.—A visit to the Imperial mine convinces one that Supt. Dougherty has a force of men that is doing an immense amount of work. No. 5 tunnel is being advanced as rapidly as possible to facilitate the handling of the ore taken from the different stopes.

A CRAWFORD MILL TO BE ERECTED.—A Crawford mill may be erected in Kennedy in a few weeks. This mill is highly spoken of and may be just the thing needed for the treatment of the sulphuret ores of the camp. Post & Haven have five Crawford mills, reducing sixty tons of sulphuret ore daily, assaying $10 a ton in gold, in the Deep Creek country of eastern Nevada, and save $8 a ton, one man only on a shift being required to attend the mills, which are operated by a forty-horse power engine and boiler. A cleanup is made every fifteen days.

De Lamar District.

NOTES.—Piocho *Record:* Work on the mill building is progressing nicely. Although a greater portion of the lumber has not arrived, there is enough on hand to keep going several weeks.

The artesian well which is being sunk by the De Lamar Company, in Cedar Wash, has reached a depth of over 100 feet. At a depth of seventy-five feet a stream of water was encountered which rose within twenty feet of the surface. Water from the well was pumped at the rate of 2000 gallons an hour and has not decreased the quantity since it was first struck.

Tuscarora District.

NAVADO.—*Times-Review:* The crosscut on the 150-foot level has been extended seven feet. No material change.

BELLE ISLE.—North drift, east vein, 250-foot level, extended ten feet. South intermediate, same vein, has been extended six feet, showing good ore along the top. The stopes are yielding about as usual.

ARIZONA.

STRIKE IN THE HARQUA HALA: Phœnix *Herald.*—Mr. David Armstrong is in the city from the Harqua Hala mountains. The primary object of Mr. Armstrong's visit to Phœnix was to bring the glad intelligence to his partner, Mr. Frank Smith, that on Monday night the night shift on their property uncovered a three foot ledge of ore that means a fortune to them. The ledge has been traced for a thousand feet up the mountain and is free milling gold which will go from $150 to $500 per ton. Several pockets have been found in the ledge which will go over $5000 to the ton. It is an immense find and both partners are consequently jubilant.

Arrangements have been made with Mr. W. C. Davis of Goldeu wherby the ten stamp mill on his claim will at once be put to work on ore from the new find and bullion produced.

There is plenty of water and a large spring is located on the claim from which water will be piped to the mill and used to furnish power through a motor for the running of the mill.

At Sunset camp Mr. Chas. Prange has twelve men at work developing his property which is showing up nicely, the shafts are down about 140 feet and all in good ore. Hoisting works will be put up on Mr. Prange's return from St. Louis where he is now on other mining business.

MONTANA.

AROUND BUTTE.—*Inter-Mountain:* A number of well known Butte mining men have secured a lease on some valuable placer ground owned by Silas F. King, in the Pioneer district, about twelve miles from Drummond, and are now making the necessary arrangements to work it on an extended plan next spring. The properties are situated at the head of Deep creek, and some time ago were bonded for $150,000. Owing to the scarcity of water, however, the ground could not be worked at a profit. The mining men who have the properties now in hand have made extensive arrangements for working them. A mammoth pump and the necessary pipe have been ordered. This pump will be placed one and one-quarter miles from the placer grounds and at a point 700 feet lower. Mining men of this vicinity who are familiar with the property say that Henry Albertson and others who are interested in the properties will net anywhere from $2,000 to $5,000 a day after they get everything in working order.

MINING NOTES.—The new shaft of the Mountain Con. No. 2 has reached a depth of 700 feet. Sinking will be continued another 100 feet, when the old working of the Mountain Con. No. 1 will be connected at the 800-foot level.

It is rumored that a change of management took place recently in the Jay Hawk Mining company at Ponsonby.

It is said that the Anderson mine in the Ground Squirrel district will shortly pass into the hands of the Butte & Boston company if satisfactory terms can be agreed upon.

Devine & Co., who are working the Odin, in Dublin gulch, west of the Never Sweat, have completed developing the shaft and are now cross-cutting for the ledge at a depth 150 feet. The lessees also have a bond on the property for $50,000, which they hope to raise.

The Parrot company, which a few years ago was the only company using the Bessemer converter for copper, has numberless imitators now all over the world. New refineries worked by this process are now quite common in the east.

John Alix, Leon Dussault, Joe Gosselin and R. G. Robinson have secured a lease on the Dennise A and Adelaide quartz claims, south of Rocker, and will at once commence work. These properties are owned by A. J. Marchand & Co., but very little development work has been done on them.

OREGON.

AROUND JACKSONVILLE.—*Times:* W. L. Weatherred of Portland, a stockholder in the Annie Mining Co., has received notification of the sale of the mine to San Francisco capitalists, the consideration being $61,800.

The Sterling Mining Co. has finished cleaning up last season's work and will resume piping at an early day. It is stated that they have done exceedingly well during the past year, gold dust to the amount of nearly $100,000 being the result. It is probably the best placer mine in Oregon.

The coming year promises to be the best in the last quarter of a century for the mining interests of southern Oregon. Capitalists are becoming interested in our mines, and the more they investigate the better they like the prospects. The developments in quartz mining for the past few months have demonstrated the fact that the mineral deposits of this section are in ledges and not mere pockets.

Two practical miners—Mattern and Sackett—have been at work in a prospect tunnel, on land belonging to G. F. Billings, about a mile north of Ashland, in a place which was abandoned by an Ashland company last winter, after it had been driven more than 100 feet. The old company ran by the ledge they were looking for without knowing it. Mattern and Sackett found a five-foot fissure, and in their prospect drift upon it have taken out considerable pay rock. Last week they sent four and one-half tons of the ore to the Selby smelter, at San Francisco, and their returns showed that it yielded, gross, about $1500, and netted them here, above all charges, $1290.98. They are believed to have a true fissure vein and a valuable property.

BROWNTOWN NOTES.—Rogue River *Courier:* Griffin struck some of the richest rock in his new tunnel the other day that has ever been seen in this section. Some of it will go from $3 to $4 to the pound weight, or from $6000 to $8000 to the ton, and you can scarcely look at a piece of it without seeing free gold.

Three men—new-comers from Washington—have been prospecting in the same range south to the California line and have found the southern extension of the same ledge covered with shale and cased in hard slate. The ledge, where opened, is from two to three feet in width and prospects well in free gold. The season is now too far advanced for them to do much more than prepare for an early spring work.

Removal.

The Fort Wayne Electric Corporation, Frank G. Cartwright, Pacific Coast Agent, has removed its office from 41–43 Stevenson St., to No. 35 New Montgomery St.

The Annual Convention

OF THE

California Miners' Association

WILL BE HELD IN

SAN FRANCISCO,

MONDAY..... November 19th, 1894.

Questions of importance to the Quartz, Drift and Hydraulic Mining Industry in California will be considered, and County Mining Associations are requested to appoint delegates at once.

Our Senators and Congressmen are expected to be present at this Convention and the Miners of the State will have an opportunity of bringing before them such matters as affect the welfare of the Mining Industry.

Place of meeting will be published later.

EXECUTIVE COMMITTEE CALIFORNIA MINERS' ASSOCIATION.

By WM. C. RALSTON, Secretary.

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Electrical Progress.

Interesting Electric Welding.

A formidable rival to the big steam shovel in the curiosity of the Cleveland public at present is the electric welding apparatus iu use on the street-car lines. It is rcally an interesting as well as an important machine.

Two pieces of steel on either side of the rail between the ends of the rails about three inches one way, two inches the other, and an inch and a half thick, shaped to fit the web of the rail and the flange, are placed exactly opposite each other. A heavy movable swedge, with jaws on each side of the rail, controlled by an immense screw in the hand of the foremau, holds the two pieces of steel up tight to the rail. A powerful alternating curreut of electricity is applied to each piecc of steel on the sides of the rails. Iu five minutes the steel and the ends of the rail are red hot; in ten minutes they are glowing red hot; in twelve minutes they sparkle and arc at a welding heat, as if placed under the blast of a melting furnace; a little more application of power by the great jaws on either side of the rail under the intense heat and the steel is pressed into space between the ends of the rails, aud the weld is completed. The current is withdrawn, the rail begins to cool, the big compress is moved back, the men with chisel and hammer clip off the cinders or the scales, and the big rails, seven inches in height, are welded together and make one continuous solid piece of steel.

Cost of Street Cars.

Six years age the price for a complete trolley car, including two motors, was $4500. A year and a half thereafter it dropped to $3500; two years ago it was $2850; one year ago it was $2000. With the decrease in price the equipment has greatly improved iu quality and efficiency. The average price of the same apparatus to-day is between $1000 and $1200. A recent order for a single car was competed for by seven coiccrns. All the companies paid traveling expenses of representatives. Bids ranged from $1500 to $640. It was let to the lowest figure. Iu January, 1890, there were 161 electric railways in operation and iu process of construction. Iu January, 1892, this number had growu to 281. To-day there are 500 cities using electricity. Many of them are traversed by great mileage. This reduction in price, in the face of an increase in the demand, has been due to competition and a reduction in the cost of manufacture, accompanied by an increase in the quality of the product. The profit on a car sold in 1892 at $2850 was greater than the same goods sold in 1888 at $4500. We do not believe that any company can make and sell satisfactory car equipments at a profit for $640. If this competition keeps up, as it probably will for some time, we do not see how profits are to be made unless a wider market than at present exists is developed. It cannot be hoped for a growth during the next six years so marvelous as that which took place between 1888 and 1894. Nevertheless it is believed that much can be done to widen the field of consumption of electrical apparatus of all kinds, especially railroad equipment.—Electrical Review.

A DEVICE for connecting a movable vessel with the shore by a cable capable of transmitting 200 horse power is described and illustrated in the London *Electrical Review* of a recent date. The cable is connected to a well-insulated movable joint at the anchorage of the vessel, wheuce connection is made with the vessel. The intention was to use it with a wave motor, but it can be used also for lighting lightships electrically from a generating plant on the shore.

A MAN of Tennessee, says the *Electrical Review*, has been turned into a colored man by a stroke of lightning. A writer in the New York *Sun* says that all the dynamos of New England must cease running for forty-eight hours to stop the drouth in that section by keeping electricity from floating upward aud dissipating humidity. With electricity descending and transforming Caucasians into Africans, and electricity knocking out Jupiter Pluvius, one may venture to remark that electrical wouders never cease.

THE portable electric lamp has come into frequent use in London, and it now forms part of the regular equipment of the omnibus inspector, who finds it of the greatest service in the performauce of his night duties.

Flying Machines.

I am quite frce to admit that the navigation of the air is beset with a great many dangers; it is also very dangerous to make high explosives or fire large guns, but it is iufinitely more dangerous to be within the range of the enemy's guns. What I propose to do is to enable one to assail an enemy from a distance greater than the enemy will be able to strike back with the most powerful gun in existence. So I think it would be quite as safe for combatants to employ my means of assault as to employ the preseut means, which necessitate their approaching nearer to the enemy and having to receive his fire. I do not know that any one has ever inventcd a system of warfare which is perfectly safe. It is known now to be possible to make a machine that will actually fly at a very high velocity; so nothing remains to bc done except to learn how to manœuvre it. In view of the decided advantage which the flying machine would give its possessor over an enemy, I do not think that in case of war European nations would hesitate to employ them, cven if one-half of the meu navigating them were killed. At the preseut time uo difficulty is ever found in getting volunteers to make a torpedo boat attack upon a mau-of-war, something which is iufiuitely more dangerous than navigating a flying machine would be, as the latter might be painted black and make its attack at night or in a fog, when it would be quite impossible for the enemy to strike back. War, at best, is a dangerous game, and those entering upon it are playing with dangerous instruments, whether they are guns, dynamite or flying machines. —Hiram S. Maxim.

The Velocity of Express Trains.

The express traius between London and Edinburgh travel on an average about forty-three miles an hour, including stoppages, or fifty-oue miles an hour without including stoppages; to attain this rate, a speed of sixty miles an hour, or seventy where the road is favorable, is adopted midway between the stations. A speed of seventy miles an hour is almost equivalent to thirty-five yards per second, or thirty-five yards between two beats of a common eight-day clock. All objects near the eye of a passenger journeying at this rate will pass by his eye in a thirty-fifth part of a second, accordiug to Dr. Lardner, aud if thirty-five stakes were erected at the side of a line, a yard apart, they would not be distinguishable oue from another, and if painted red they would appear collectively as a continuous flash of red color. If two trains with the above velocity passed each other, the relative speed would be seventy yards per second, and if one of the trains were seventy yards loug, it would flash by in a single second. Supposing the locomotive which draws such a traiu to have driving wheels seven feet in diameter, these wheels would revolve five times in a seeond, aud the pistons would move in the cylinders ten times in a second, and as there are two pistons which act alternately, there would be twenty puffs or escapes of steam in a second. Such a locomotive speed is nearly equal to one-fourth of that of a cannon shot from a gun.

RUPTURE!

IT has been considered by the medical profession that heroia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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Table of Contents:—Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12-mo pages, with illustrations, well bound in cloth; 1893. Price $1.00 postpaid. Sold by The Dewey Publishing Co., Publishers, 220 Market St., San Francisco.

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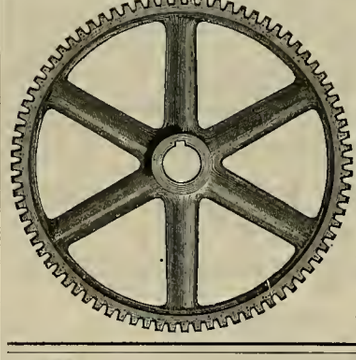

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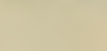

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Practical Information.

Japanese Lacquer.

The famous varnish so extensively employed by the Japanese for lacquering various articles of furniture and small ware is obtained from a tree known to science as *Rhus vernicifera*. This varnish tree, which is called *urushi-naki* by the Japanese, grows to a height of about thirty feet, and at the age of forty years its trunk is forty inches in diameter. It reaches its greatest perfection in its eighteenth year, and then produces its largest yield of lac or varnish. The lac tapper carries a bow-shaped knife with which he cuts a two-millimeter gash in the trunk of the tree, and he then draws the point of the knife through the cut again in order to remove any chips formed by the first incision. This cut is made low down. On the opposite side of the trunk, a little farther up, he makes a second cut, and then on this side again, and so on, until he has made from six to ten incisions. After he has operated thus upon about a dozen trees, the tapper returns to the first tree and collects the fluid that has oozed from the cuts, which, at first milky white and thick, becomes, through exposure to the air, first dark brown and finally black; this crude lac is called *ki-urushi*. The tree is hacked in this way for from sixty to eighty days, until it dies. It is then cut down, and the wood is chopped up and put into hot water, which extracts the last remnant of the liquid, amounting to not more than half a pint. This forms the poorest quality of lac. The lac is purified by filtering it through cotton stuff, grinding on a paint slab, mixing with water, and then evaporating the latter by heat. The finer sorts are bleached in shallow dishes in the sun. There are about twenty different kinds in the market.—Lumber World.

Digestibility of Foods.

Animal foods, such as meats, fish, eggs and milk, are rather more digestible than most of the vegetable foods, although bread made from ordinary white wheat flour is very easily and completely digested. Bread from whole wheat flour, or that from which only part of the hull of the grain has been removed, is not so completely digestible, but is decidedly healthful for some people in aiding the passage of the food through the intestines.

There are great differences in people in respect to their power for utilizing different kinds of food. Milk is one of the most wholesome and digestible of foods, and yet there are people who cannot endure it. Late research makes it probable that in the changes which milk undergoes in the body injurious compounds are sometimes formed, and that this is the reason why milk does not agree with some people. The case is the same with eggs, with certain fruits, as the strawberry, and indeed with many different food materials. Hence it may be literally true that "One man's meat is another man's poison." But while there are exceptions, the general rule holds good that for ordinary people with good powers of digestion and assimilation, the nutritive values of the ordinary standard food materials are measured pretty accurately by their chemical composition, and that the right mixtures of food are those which furnish the nutrients in the proportions demanded by the body.—Prof. W. O. Atwater.

An Illustration of Power.

If it were possible, says the *Polytechnic*, to place 300 oars on each side of the ocean steamer Campania, making 600 oars altogether, each worked by three men, there would be 1800 men at work at one time. As they could not work continuously for twenty-four hours, but only for a total of eight hours for each man, divided into four watches, it would be necessary to have a crew of 5400 men to man the ores. If six men could develop one horse power, the total horse power developed by the 600 oars handled by 1800 men would be but 300, as against 30,000 in the Campania, or the same power would require the employment of 180,000 oars and a crew of 558,000 men to manipulate them.

Curiosities About Wood.

The strongest wood which grows within the limits of the United States is that known as "nutmeg" hickory, which flourishes on the lower Arkansas river. The most elastic is tamarack, the black, or shellback, standing not far below. The wood with the least elasticity and lowest specific gravity is the ficus aurea. The wood of the highest specific gravity is the blue wood of Texas and Mexico. The heaviest of the foreign woods are the pomegranate and the lignum vitæ; the lightest, cork. The tensile strength of the best known woods is set forth in the following: Ash, 14,000 pounds; beech, 11,500; cedar, 11,400; chestnut, 10,500; cypress, 6000; elm, 13,400; fir, 12,000; maple, 10,500; American white oak, 11,500; pear, 9800; pitch pine, 12,000; larch, 9500; poplar, 7000; spruce, 10,200; teak, 14,000; walnut, 7800; willow, 13,000; lance, 23,000; lignum vitæ, 11,800; locust, 20,500; mahogany, 21,000; maple, 10,500.

The weight in pounds per square foot (without fractions) of the well known woods (dry) is as follows: Butternut, 25; cedar, 35; cherry, 44; chestnut, 38; cork, 15; dogwood, 47; ebony, 83: box elder, 43; elm, 41; blue gum, 52; water gum, 62; white hickory, 49; shellbark hickory, 43; holly, 47; juniper, 35; lancewood, 45; larch, 34; basswood or linn, 37; mahogany, 66; hard maple, 46; white maple, 34; mulberry, 35; white oak, 53; persimmon, 44; pear, 41; pitch pine, 41; red pine, 36; white pine, 34; yellow pine, 33; plum, 49; poplar, 33; quince, 44; rosewood, 45; sassafras, 30; spruce, 31; sycamore, 38; tamarack, 23; black walnut, 41; white walnut, 32; the willows, from 30 to 36; and the yew, 49.

Four hundred and thirteen different species of trees grow in the various States and Territories, and of this number sixteen, when perfectly seasoned, will sink in water. These woods of high specific gravity grow mostly in the arid regions of New Mexico, Arizona and Nevada.

It is said to be probable that a large number of German soldiers will be equipped with portable electric batteries weighing about half a pound. A small lamp goes with the battery, and the invention will be of great value to the men employed about powder magazines. The batteries are also to be used for signaling from balloons at night, and can be fixed to the helmet when the men have to dig trenches after dark.

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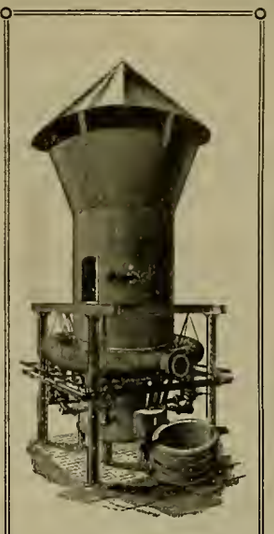

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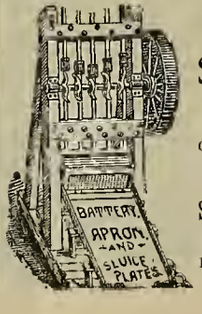

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Market Reports.

The Markets.

Silver in October.

The following shows the daily prices of silver per ounce in New York and London during the month of October:

Date.	New York. (Cents.)	London. (Pence.)
1	63¼	29 3-16
2	62⅞	29
3	62¾	28 15-16
4	63	29
5	63½	29¼
6	63¾	29 5-16
8	64⅛	29 9-16
9	63¾	29⅜
10	63½	29 3-16
11	63¾	29 5-16
12	63¼	29 1-16
13	63¼	29 1-16
15	63⅜	29 1-16
16	63½	29⅛
17	63½	29⅛
18	63¼	29⅜
19	63⅛	29
20	63	28 15-16
22	63	28 15-16
23	63¼	29 1-16
24	63⅜	29⅛
25	63⅜	29⅛
26	63⅞	29¼
27	64	29 5-16
29	63¾	29¼
30	63⅝	29 3-16
31	63⅝	29 3-16

The London quotations are per ounce 925 fine and 1000 fine New York. The highest and lowest prices for the month were as follows:

	London.	New York.
Highest	29 9-16d	64⅛c
Lowest	28 15-16	62¾
Difference	⅜d	1⅜c

In September the difference between the highest and lowest London prices was 1 1-16d, and 2½c in New York.

In September the London market opened at 30¼d and closed at 29 3-16d. The highest price during the month was 30½d. The New York market opened at 65¾c and closed at 63¼c, the highest being 65¾c.

The highest and lowest prices monthly compare as follows:

	New York		London	
	Highest.	Lowest.	Highest.	Lowest.
January	69c	66¼c	31¾d	30¼d
February	66⅝	59¾	30 11-16	27⅛
March	60¾	*58¾	27⅝	*27
April	64¼	61½	29⅝	28⅛
May	64¼	61⅝	29¼	28 1-16
June	63⅛	61¾	28 15-16	28 5-16
July	62¾	62	28 15-16	28 7-16
August	60⅛	62½	30½	28 11-16
September	65¾	63¼	30¼	29 3-16
October	64⅛	62¾	29 9-16	28 15-16
Highest	69c	....	31¾d	....
Lowest	....	58¾	....	27

*Lowest on record on the 3d and 5th.

New York Prices.

NEW YORK, Nov. 1.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29½	63⅝	....	....	....
Friday	29½	63⅞	9 25	3 15	19 25
Saturday	29¼	64	9 30	3 16	....
Monday	29 5-16	63¾	....	....	....
Tuesday	29¼	63¾	9 40	3 18	19 10
Wednesday	29 3-16	63⅝	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.87½
London Merchants	$4.84½
London Sight Bankers	$4.87½
Refined Silver, per ounce	63⅝
Mexican Dollars, nominal	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	11
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	7¼
Concentrated, "	—	@	6½
COPPER.			
Bolt	22	@	—
Sheathing	23	@	—
Ingot, jobbing	—	@	20
Ingot, wholesale	15	@	16
IRON.			
Pig, per ton	16 00	@	20 00
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 55
Drop, B and *larger* sizes, " "			1 75
Buck, Balls and Chilled, do. " "			1 85
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
STEEL.			
English, lb	14	@	16
PIG TIN.			
Per lb	17	@	18
ZINC.			
Sheet	8½	@	
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 75
Creta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			9 50
Wallsend			7 00
Scotch Splint			7 00
Brymbo			7 50
West Hartley			7 75
TO ARRIVE—PER TON.			
Australian	6 50	@	— —
Liverpool Steam	6 75	@	— —
Scotch Splint	6 75	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 50	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Nov. 1, 1894.

Though last week closed with considerable quietness in the local mining share market, there has been some activity and strength manifested during the latter part of this week.

News has been received that the Con. Virginia winze has reached the 1750-foot level, and that further siuking will be suspended until connection has been made by drift between the old openings west of the C and C shaft and the new ore body. They are also preparing to drift south in the ore body from the bottom of the winze.

Three more bars of bullion have been shipped from the Consolidated California and Virginia mine to the Carson Mint. The value of the same is $17,086.95, of which $10,000 is gold and the balance silver. The total shipments of the month thus far reported are $46,-792.68, but nearly $100,000 more will come before the monthly run is over. The increase of the gold in the bullion this month is remarkable.

At the annual meeting of the Alpha Con. Mining Company 85,585 shares were represented, and the old directors and officers were re-elected, with Charles Hirschfeld as president; A. K. P. Harmon, vice-president; Charles E. Elliott, secretary, and A. C. Hamilton, superintendent. There was $2452.95 in the treasury October 1st.

The following illustrates the changes of the week:

MINES.	25	1
Alpha	....	$ 6
Alta Consolidated	$ 23	20
Andes	59	59
Belcher	98	85
Best & Belcher	1 20	1 15
Bodie	....	1 20
Bullion	33	35
Challenge	45	....
Chollar	72	72
Confidence	1 25	1 05
Consolidated California and Virginia	4 95	4 85
Consolidated New York	....	3
Crown Point	74	60
Exchequer	....	06
Gould & Curry	63	65
Hale & Norcross	78	85
Justice	25	24
Mexican	1 30	1 20
Ophir	3 10	3 05
Overman	....	18
Potosi	70	65
Savage	66	69
Sierra Nevada	90	89
Union	65	65
Utah	5	....
Yellow Jacket	80	71

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 1, 1894.

9 ANN 10:15 A. M. SESSIONS.

300 Andes	59	200 Gould & Curry	64
100 Best & Belcher	1 15	100	65
50 Bullion	35	300 L. Wash	02
100 Caledonia	13	300 Ophir	3 05
100 Chollar	72	430 Savage	69
100	71	300 Scorpion	02
200	20	250 Sierra Nevada	89
600 Con. Cal & Va	1 85	200 S Hill	04
300 Con New York	03	50 Union	65
100 Exchequer	06	200 Yellow Jacket	71

SECONN SESSION—2: 30 P. M.

200 Andes	56	400 Justice	23
300 Alpha	6	100	24
500 Alta	20	100 Mono	19
250 Bodie	1 20	150 Mexican	1 20
150 Belcher	85	650 Ophir	2 95
120 Best & Belcher	1 10	200 Overman	18
300 C. C. & Va	4 75	100 Potosi	65
400 Crown Point	60	500 Savage	61
100 Confidence	1 05	700	62
300 Chollar	66	200 Sierra Nevada	84
200 G & C	63	100 Seg Belcher	15
200 Hale & Norcross	85	150 Union	62
200	84	50	61
100	83	150 Yellow Jacket	66

Coast Industrial Notes.

—Steady progress is being made on the extension of the Lone Pine canal, Inyo county. The work around the point of the Alabama hills is necessarily slow, but water for irrigating the valuable country around Lone Pine will be flowing through the ditch before spring.

—The spars that were lost in the breaking up of the Coos bay raft about a year ago are still being picked up along the beaches of Del Norte county, says the *Record*. A large number were gathered up along the beach above Point St. George and dumped into Lake Earl and a raft made up and towed down to the Lake Earl mill, from which place they are being hauled to this place over the railroad.

—There are now twenty-two teams engaged in hauling freight from Nevada City to different places above, says the *Transcript*. Much of this freight is for Sierra county and consists of winter stocks of goods for the merchants in that section. There has been more freight sent up country this season than for any like period during the past ten years, and more mining machinery has been hauled than ever before in one season.

—On account of the slowness with which the silver-lead ores are flowing into the smelters in the valley, the Germania (Utah) has been forced to blow out one furnace and its capacity is now being reduced to a single stack. This latter is of usual size, however, and will be able to handle nearly three-quarters of the amount of ores formerly treated by the two stacks. The owners of the other two smelters are also complaining of a shortage of ores of all classes, and unless there is a change for the better in the very near future others of the stacks will of necessity be blown out.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alta S M Co, Nev	47	10c	Sept 12, Oct 17, Nov 7	J E Jacobus, 309 Montgomery
Belcher M Co, Nev	49	25c	Sept 14, Oct 18, Nov 8	C L Perkins
Golden Eagle M Co, Nev	1	15c	Sept 15, Oct 16, Nov 5	E B Holmes, 309 Montgomery
Ideal Placer M. W & P Co, Cal	1	10c	Sept 11, Oct 22, Nov 12	E L Mayer, Mills Building
Lady Washing'n Con M Co, Nev	10	5c	Oct 5, Nov 9	J E Jacobus, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3, Nov 8, Dec 3	J W Pew, 310 Pine
North Banner Con T Co, Nev	32	3c	Oct 6, Nov 6, Nov 27	C E Green, Fourth and Townsend
Scorpion M Co	6	5c	Oct 4, Nov 9, Nov 30	Geo R Spinney, 310 Pine
Silver King M Co, Ariz	12	30c	Sept 4, Oct 15, Nov 12	J W Pew, 310 Pine
Starlight M Co, Nevada	3	10c	Oct 10, Nov 19, Dec 10	H R Williar, 321 Pine
Utah Con M Co, Nev	20	5c	Sept 28, Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3	....	Sept 27, Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Siskiyou Con Q M Co	Edward F. Stone, 306 Pine	Nov 6

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 23, 1894.

528,059.—SASH BALANCE—W. R. Abrams, Los Angeles, Cal.

527,942.—FIRE LADDER—A. B. Cairnes, San Diego, Cal.

528,127.—CIRCUIT CHANGER — Hunter & Lough, Seattle, Wash.

527,991.—PADDLE WHEEL — Jos. Jacobs, Nevada City, Cal.

527,997.—LEAF TURNER—H. Kramer, S. F.

527,798.—MARINE PROPULSION—J. S. Martin, Snohomish, Wash.

527,868.—AUTOMATIC DUMP—C. D. Matheny, Seattle, Wash.

527,803.—PENCIL SHARPENER — J. C. McCollum, Los Angeles, Cal.

528,105.—GAS ENGINE—H. B. Migliavacca, Napa, Cal.

527,872.—BED CLOTHES HOLDER—Carrie E. Muller, S. F.

528,628.—BICYCLE STAND—F. H. Pierce, San Jose, Cal.

527,905.—OLIVE MILL—Toulouse & Delorieux, S. F.

527,911.—CLOTHES PIN—W. D. Watkins, Yoncalla, Or.

529,917.—PIPE WRENCH—J. D. Wilson, San Diego, Cal.

23,733.—DESIGN FOR LAST—N. Bier, Salem, Or.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

EXTENSION FIRE LADDER AND TRUCK.—A. B. Cairnes, San Diego, Cal. No. 527,942. Dated Oct. 23, 1894. This invention relates to extension fire ladders and trucks. The object is to provide a ladder which is capable of being raised to any desired angle between the horizontal and the perpendicular, and which may be extended to any distance practicable for the number and length of ladders connected together; a truck upon which said ladders are mounted with a mechanism whereby they are raised and extended; and an attachment for carrying a quantity of hose in addition to the extra ladders, without raising the frame of the truck so high as to make it top heavy. The invention includes a frame mounted upon wheels having rack bars extending along its sides, a ladder having a shaft extending across its lower end with pinions adapted to engage and travel upon the rack bars, and a means for rotating said pinions and retaining the foot of the ladder at any point in its advance; fulcrum rods having one end connected with the rear of the frame, and the other end with the sides of the ladder whereby the ladder is raised to any desired angle by causing its foot to approach the rear of the supporting frame; a ladder slidable in guides upon the main ladder; sprocket wheels mounted upon shafts at opposite ends of the main ladder, a chain passing around the sprocket wheels having its ends connected with the second ladder whereby the latter is caused to advance within its guides, and a third ladder slidable upon the second one with a rope connected at one end with the top of the first ladder and the other with the bottom of the third ladder and passing around the pulley upon the top of the second ladder so that it is advanced and extended while the second ladder is being extended. Stop pawls are fulcrumed to the foot of each movable ladder, adapted to engage the rounds of the ladder below to prevent the ladders from slipping down in case of a ident.

FEATHERING PADDLE WHEEL. — Joseph Jacobs, Nevada City, Cal. No. 527,991. Dated Oct. 23, 1894. This wheel is one of that class in which the driving blades are adapted to be successively turned from the plane of rotation of the wheel to a plane at right angles thereto. The wheel consists of a body composed of a metallic skeleton filled with wooden pieces, leaving openings near the wheel rim and covered on either side by metallic plates formed with openings in their outer edges, and a series of driving blades having radial shafts pivoted in the wheel rim and provided with cross arms adapted to be acted upon by fixed cams to turn the blades into and out of action, the arms playing in and out through the openings in the wheel plates. This wheel, by reason of its general construction, combining lightness with strength and the removal of all causes tending to offer resistance, and by reason of the positive and quick action of the means for turning the driving blades, is especially adapted for complete submergence, and is particularly useful for tugs, in towing boats on canals, and for the boats themselves, as the banks are not washed or worn by the slight disturbance of the water by the wheel.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

Notice of Assessment.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1894, an assessment, No. 1, of 5 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 56, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of December, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, 309 Montgomery St., Room 56, San Francisco, California.

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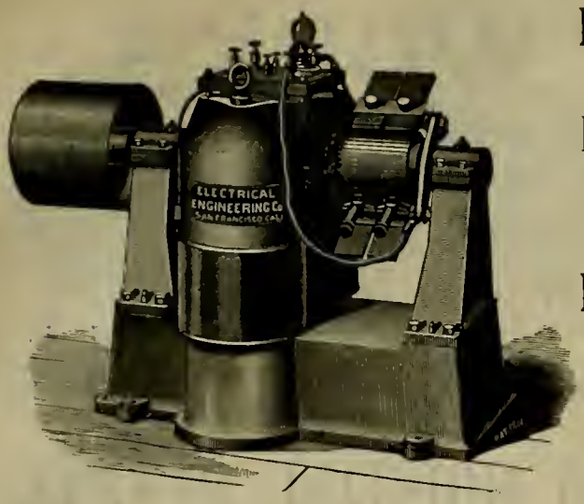

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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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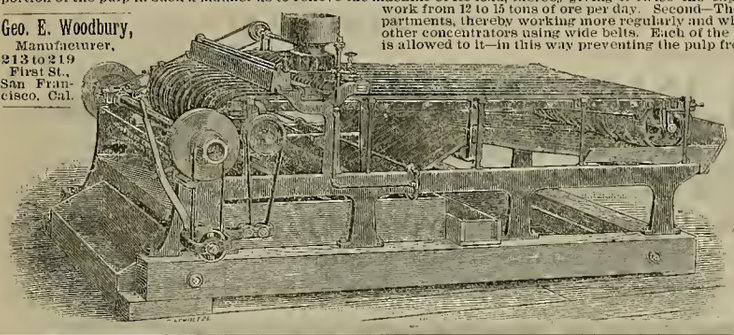

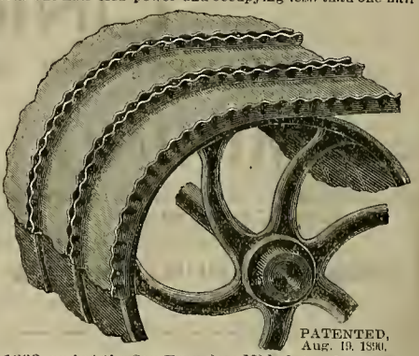

PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894.

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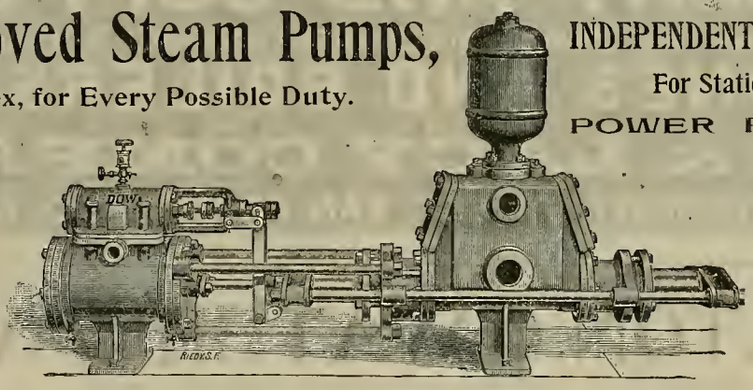

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 19. SAN FRANCISCO, SATURDAY, NOVEMBER 10, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Natural Soda in California.

California is one of the few localities in the United States where natural soda is found. The geographical occurrence of this substance in the United States is principally confined to the arid regions of the Great Basin, especially to the soda lakes near Ragtown, Nev.; Mono lake, Mono county, and Owens lake, Inyo county, Cal.; and Albert lake, Or., and to many dry deposits and incrustations in the same region. A full chemical discussion of the nature of natural sodas and their technology, together with numerous analyses of the waters of the soda lakes and dry deposits, are given by Dr. T. M. Chalard in Bulletin No. 60 of the U. S. Geological Survey. The lakes, as shown by Messrs. King, Hague (40th Parallel, II) and Russell (Eighth Annual Report and Monograph XI, U. S. Geological Survey) are, for the most part, the residues left by the evaporation of larger bodies of crates, the shore lines of which can be traced at considerable distances, sometimes several hundred feet above the present beaches, showing that the old lakes covered wide expanses of the present desert.

The concentration by evaporation of the waters of the former lakes has increased the proportion of their mineral salts, and sometimes this concentration reaches the crystallizing point, when the sodium carbonate appears as a white incrustation on the surface and shores of the lake. The origin of this salt is explained by the geology of the region where it occurs, which is given in the reports above referred to. Mono and Owens lakes, in this State, are outside the great hydrographic basin of Lake Lahontain. Professor Russell describes the geography and geology of Mono lake in the Eighth Annual Report of the U. S. Geological Survey. Its hydrographic basin has no outlet, but streams and springs feed the lake, and the only escape for the water is by evaporation. The ancient shore lines can be traced far up on the sides of the Sierra Nevada, which formed the western shore of the ancient lake. There are springs in the bottom of the lake and near its shores. They are especially abundant near the base of the mountains—the seat of former orographic movements—and a belt of hot springs extends along the range for hundreds of miles. Just south of the lake is a series of volcanic cones known as Mono craters, so that the locality is one of former volcanic activity. The high saline contents of this and other lakes is due to the gradual concentration of its own water supply.

THE better a "prospect" is developed the better prospect there is of disposing of it. Men who find a claim, dig a twenty-foot hole, get out a ton or so of rock and then sit down and wait for some capitalist to come along and buy it are apt to wait for some time. Capitalists are not buying that sort of a "mine." In fact, there is nothing to show an intending purchaser under such circumstances. The "work your own diggings" principle is a pretty good one to bank on, and will win every time if the claim has any merit. Of course, ordinary prospectors are generally unable to sink a shaft several hundred feet deep, run drifts and put up machinery, but they can do enough work on their claims to make some kind of a showing, even if it does take time. Gold mining properties, both large and small, are in such demand these days that it seems foolish to let claims lie idle with only twenty-five or thirty-foot shafts on them. A reasonable amount of development work is expected, even on prospects, by men who are asked to examine them with a view to purchase.

THE McLEWEE IMPROVED AUTOMATIC SAFETY WATER GAUGE.

Automatic Water Gauge.

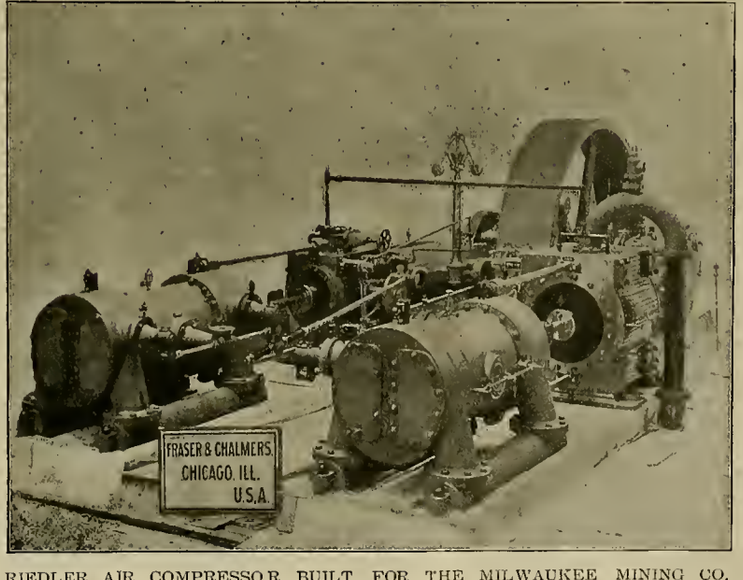
The device illustrated on this page—The McLewee Improved Automatic Safety Water Gauge—is coming into very general use by Eastern engineers, but has only recently been introduced on this coast. It is designed for locomotive, marine and stationary engines, and the claims made for it are that there is no breakage of glass, no stuffing of boxes and no leaking. A mica shield or casing protects the glass from air currents or accidental spattering by cold water. It also prevents the glass from flying in case of breakage. It may be quickly removed or replaced by simply turning the thumb-nut locking device at top and bottom, as shown in cut; the upper end of the shield being open and the lower part closed. The packing at the top and bottom of the glass consists of vulcabeston gaskets, arranged so that the pressure of the packing is all against the end of the glass. The latter does not come in contact with the metal at any point.

To put in a glass, which requires less than a minute, the hollow glass shown in section on the upper connection is screwed upward on the nipple, the glass is inserted, and the nut screwed firmly down, making an absolutely steam-tight joint.

The upper gasket rests in a collar, which is kept from turning with the nut by faces on the end of the nipple, and the latter is made steam-tight by packing between the nut and the collar.

In case the glass breaks, the steam and water connections are instantly closed, automatically, by ball check valves, one of which is shown in the sectional part of the lower connection. These drop back by gravity against a removable wire retainer, or are forced back by the point of the valve-stem when the valve is closed.

This gauge is manufactured only in New York, and is being introduced on the Pacific coast by D. M. Doub, manufacturers' agent for steam specialties, 137 First street, this city.



RIEDLER AIR COMPRESSOR BUILT FOR THE MILWAUKEE MINING CO.

The Riedler Compressor.

This is one of the recent productions of the Fraser & Chalmers Works, Chicago, and is offered to the trade by that well known house. In reply to an inquiry concerning the machine herewith illustrated, Mr. C. H. Fitch (of Fraser & Chalmers) writes us as follows:

The 18x30-inch double Riedler compressor, driven by 18-inch and 28x30-inch Corliss compound engine for the Milwaukee Mining Co., takes the place of a smaller compressor of another make, and does twice the work on one-fourth less fuel, so that the cost of fuel for similar work is as 1 to 2¾ between new and old plants. In this case, wood being $3.50 a cord, the reduction of fuel bill on the basis of power now used amounts to $9000 a year. This result is due in large measure to the better adjustment of engines to their load—to good steam engineering, but it is also an illustration of the success of the Riedler system.

SINCE the passage of the Caminetti law requiring miners to build restraining dams for their debris, there are already constructed or in process of construction, dams and impounding reservoirs with a storage capacity of 21,336,723 cubic yards. These have all been built by the miners themselves without aid from the Government or State. Though both Government and State are vitally interested, neither has put up a cent towards these works.

MINING AND SCIENTIFIC PRESS.

Office, No. 220 Market Street, Northeast Corner Front, San Francisco.
Take the Elevator, No. 12 Front Street.

Terms of Subscription.

Annual Subscription, $3. New Subscriptions will be declined without cash in advance. All arrearages must be paid for at the rate of $3.50 per annum.

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Our latest forms go to press on Thursday evening.

Entered at the S. F. Postoffice as second-class mail matter.

San Francisco, November 10, 1894.

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FOR the two illustrations and much of the matter in the artiele "Measurement by Miner's Inch" in the issue of October 6th, '94, this paper is indebted to the firm of Jas. Leffel & Co., Springfield, Ohio.

MAMMOTH EDITIONS of the MINING AND SCIENTIFIC PRESS will be issued on the 17th and 24th inst. respectively, in connection with the aunual convention of the California Miners' Association. The matter is one of interest to every one connected in any way with the mining iudustry in this State and all over the west half of America.

MR. SUTRO's new baths out at the ocean beach will accommodate 40,000 people a day. As they are to be cleaued daily—the baths and people both—some of the professioual anti-debris agitators now out of a job in the hydraulic mining regions, better look after this outfit and see that the debris resulting from the operation does no "matcrial iujury to the uavigable waters or lands adjacent thereto."

THE fabulous Enoch Davis "lost mine" has been found on the South Fork of Dry Creek, Utah. The cave where Enoch chopped off the "gold" with his pen kuife has been found, but it is only "fool gold," or, in other words, iron pyrites. The fable of Enoch Davis is but one of thosc thousands of untold stories of lost gold mines of immense wealth. It has about it, however, the tiuge of romance which is not attached to all other yarns. Davis, the man referred to, was recently executed for murdering his wife. While under sentence at Salt Lake City, iu hopes of prolonging his life, he agreed to disclose the whereabouts of the mine just rediscovered, but the whereabouts of which had beeu lost. Gossip had it that the minc was a dream of gold. Its original discoverer was Edward Rhodes, a Califoruia miner in the days of Brigham Young. Rhodes was a Mormon and submitted at all times to the mandates of Brigham Youug. He told the Mormon leader of the miue, but was not permitted to work it for fear of bringing thousands of Gentiles into the Territory. Finally he told Davis, who went with him and saw the mine. On the return, Rhodes was killed by Indians. This was Davis' story, uow one of the old miniug legends. The men who found the claim had Davis' maps, and fouud everything all right except the chunks of gold. This ends another "lost minc" yarn.

The Elections and the Miners.

The prospective value of the gold iu the California hills aud mountains is just the same after as it was before the election. The question of the iudividuality or political opinions of the gentleman who occupies the gubernatorial chair has no special effect on mining property. Gold is not impaired or increased in value by the political complexion of Congress in the least. It is worth just so much and no more. Changes of tariff laws have no effect on it, as they do on some mineral products. Other values are based on gold as a standard, and this is our principal product from the mines in this State.

The only incideutal result which may have any effect on certain branches of our gold mining industry is the attitude which the newly-elected Congressmen in the mining districts may take toward it. They can exert a certain influence in Congress in favor of, or opposed to, the miners' interests. Congressmeu from all districts may, of course, do this, but those from the mining regions will naturally have more to say on these subjects.

The first and second congressional districts are most important to the miners. In the first Mr. Barham has apparently displaced Mr. Geary. The uew Congressman has in his district the mining couuties of Plumas, Shasta, Sierra, Siskiyou and Trinity—all important regions. It is understood that the gentleman is favorably inclined to the miners' cause, and will help it as far as possible. The only part of the district affected by debris questions is Plumas county, the drainage of the other mining counties being into the Klamath, a nonnavigable stream. In Siskiyou county there is said to be more miners at work than in any other county of the State.

It is in the secoud district that the most interest is taken in hydraulic mining. Mr. Caminetti, the author of the Caminetti law, has been defeated in this district by Grove L. Johnson, the talented lawyer aud orator of Sacramento. In times past Mr. Johuson has been opposed to the miners, but at the miners' convention of 1892 he was present and made a fine speech urging an amicable adjustment of the difficulties, and expressing his desire to see hydraulic miuing resumed on the basis proposed.

During his canvass Mr. Johnson distinctly favored the miners' cause in all his speeches, and he made the same speeches in the valleys as in the mountains. He has pledged himself to see justicc doue. He has stated that it is to the interest of the valleys to see hydraulic miniug resumed, under present conditions, as giving a market for valley products, and has expressed himself as favorable to Government aid for dams in the rivers.

It will naturally come to Mr. Johnson to handle any measures in the House which may affect the interests of the majority of the principal mining counties of this State. To oppose the mining interests he would have to "go back on" his pledges and specches, and this he would hardly do. The miners have helped him greatly iu his election, believing in the sincerity of his statements. The merchants of his own town want the business from the miniug section, and want hydraulic mining resumed, now that it is found the work can be carried on without injuriug the streams. Mr. Johnson, from his talents as an orator, will doubtless have more influeuce in Congress thau Mr. Caminetti had, and will exercise it on behalf of the miners of California.

Black Sands.

The first of a series of articles on the gold-bearing black sands of California, by Mr. J. A. Edman of Plumas county, will be found elsewhere in this issue of the MINING AND SCIENTIFIC PRESS. Mr. Edman's chief work has been in the deep gravels and their tailings, and the results of his researches are of great iuterest to the mining community. He has now about 300 microscopical slides illustrating the auriferous black sands and their coutents, and these he inteuds bringing to this city shortly, when they may be examined by those who wish to see them. Mr. Edman showed a number of these slides to the editor of the PRESS not long since, and they are really of very great interest.

It is uot only the black sands of the ocean beaches which contain auriferous wealth, but the black sands resulting from the washing of the deep gravels are also richer than is commonly supposed. The contents and values of these sands are described by Mr. Edman, who has been studying them for some years. Few miners pay the attention they should to the black sands which concentrate with the gold in gravel washing, or know much about them. It seems that more or less of value in them is usually lost or wasted. It will pay miuers to read Mr. Edman's article carefully, for, as stated, he has investigated this subject of black sands very thoroughly.

The Miners' Convention.

Now that the election is over, the miners of this State want to get right to work and select their delegates to the State Miners' Convention. There will be nothing savoring of politics in this connection, so all hands can join in and make the coming conveution a success. The Convention will meet at Metropolitan Hall on Fifth street, near Market, on the 19th inst. The headquarters will be at Parlor A, Palace Hotel. Proper arrangements are being made for the reception of the delegates from the interior, and the present indications are that the Convention will be a success in every way.

The miners of this State have gained a very important point in calling to the attention of Congress the fact that legislation was needed for their industry. Now they must show that more legislation is necessary. If they do not do this themselves no one else will. For years they remained without organization, and no attention was paid to individual demands. Once they became organized, however, and formulated their demands for relief, Congress listened to their petitions and granted their requests.

A beginning has thus been made, and with proper efforts, in due time, if the miners all "pull together," they will be enabled to free the mining industry from many of the burdens which oppress it. The laws need changing in many respects, and these desired changes the miners should point out. Congress will surely give due consideration to demands from such au orgauized body as the California Miners' Assoeiation. Other States should join hands with us and assist in every way.

Because we have obtained one special law from Congress, it is no reason we should rest until others which are desirable are passed. The miners have this matter to some extent in their own hands and must work out their own salvation. They must set forth their case as best they may, and it remains for Congress to consider it and afford the relief.

It is hoped to see large delegations from the mining counties, and the officers of the branch organization should at once attend to their part of the work.

The Los Angeles Oil Wells.

The oil discoveries in Los Angeles have already had the effect of bringing crude oil at that poiut from $2 per barrel to a level of 87 cents to $1. Storage reservoirs are being built and three pipe lines projected. Adequate storage facilities have not yet been provided, but the owners of wells to the north of Los Angeles, who have depended on that city for a market, will soon have to make arrangements to ship their products to San Francisco, so we should be benefited here by a cheaper fuel in due time.

The discovery of these new wells is thus important not only to Los Angeles, but to the State at large. With a more abundant and increasing supply, crude oil will be more uuiversally used as a fuel in all branches of manufacture and industry.

It really seems unnecessary to send to far-off Peru for fuel oil in San Francisco, when there is such an abundant supply in our own State. It has not been sufficiently abundant or cheap heretofore, but these new discoveries should settle those questions. The limit of consumption in the southern counties will soon be reached, aud the producers must extend their markets. The cities of the upper part of the State will get the benefit of these conditions.

Prospecting for more oil is beiug vigorously carried on, and doubtless many more producing wells will be opened. The main difficulty now is storage capacity, but that will soon be provided. Other producing sections in the same region are among the possibilities, of course, and thorough investigations are now being made.

Gravel Mines and Capital.

A number of valuable gravel-mining tracts in Baker county, Oregon, which have been worked in a small way for many years, have passed recently into the hands of syndicates, and the Baker City *Democrat* sees in this a new era in gravel mining in that section. Heretofore gravel mines have been worked by home people possessed of limited means; and, while the gold production has been considerable each year, it has been only a small per cent of what the output could have been if the mines had been equipped with the modern improvements for working. The difficulty under which mine-owners have labored in the past has been all the time realized, but there was no way out of the dilemma and there was nothing to do but bide the time when capital would see the value of the placer tracts and take advantage of the opportunity to operate them on a scale commensurate with their value and unlimited extent. The Oregon mines of this class have an advantage over many of those in California, there being no restriction on their output by reason of the vexatious debris question.

Hydraulic mines of any magnitude can seldom be operated by individuals; associated capital is necessary to open and equip them. Storage reservoirs, ditches, pipe lines and other factors for abundant and continuous water supply must be provided before the mine can be operated. In drift mines, long and expensive tunnels must usually be run before the channel can be reached and worked. Therefore in both hydraulic and drift mines an outlay of capital must be made before the mine can make any production, even small.

There are still in this State large tracts of auriferous gravel which have never been touched at all. The first cost of the ground itself is often small compared with what must be expended for suitable equipment. Therefore this class of mines is unsuited to the uses of the ordinary miner, unless he can call in the aid of capital.

The gravel fields of Oregon have never been developed on any such scale as those in this State. The ditch and reservoir system in California, connected with these mines, entailed an expenditure involving an investment of about $100,000,000. The system was gradually built up during a period of some forty years, until it became very extensive. In Oregon, the gravel fields have been worked on a small scale as compared with those of California, nor are they so extensive, but the advent of capital in that department of mining should largely add to the output of gold in our neighboring State.

The Siemens and Halske Cyanide Process.

In another part of the MINING AND SCIENTIFIC PRESS of this week is a very important article bearing on the recovery of gold by the cyanide system. It was supposed by some experts that the part that electricity played in promoting the operation of cyanide as a gold solvent was imaginary. In the light of the experiments tried at the Worcester mine, Witwatersrand, with the Siemens and Halske process on the electrolytical precipitation of gold from cyanide solutions, it seems there is something in it after all. According to the *South African Mining Journal* 3000 tons of tailings were treated at the Worcester works at a cost of three shillings per ton, the extraction being over seventy per cent. Experiments were conducted over a period of four months with this large bulk of material, so it was not a mere "sample" that was treated.

If the conclusions are correct, this Siemens-Halske process is a second great step in advance in the treatment of gold ores by cyanide, the MacArthur-Forrest having been the first. The demonstration that very weak solutions of cyanide can be successfully used in this process effects a great saving in cyanide. When the MacArthur-Forrest process failed in the treatment of complex ores, greater strength of solution was used. The Siemens-Halske people use weaker solutions instead of stronger. They do not use the zinc sponge as a precipitant of the gold, but use electricity.

The description of the plant in use at the Worcester mine, which is given in another column, while not quite complete in detail, shows that the system is not so complex as to baffle a metallurgist of ordinary scientific attainments. It will be noted, also, that the patentees of the new process propose to charge only three per cent royalty, which is much less than the charges which are being made by the old company.

The Miners' Convention.

Under date of the 7th inst., the Executive Committee of the Cal. Miners' Association has issued the following:

Our coming Annual Mining Convention, which meets on the 19th of this month in San Francisco, will be a very important session.

The principal subject to be discussed is the revision of the present United States mining laws as applied to locations of claims and the proving up of mineral titles.

The present rulings of the U. S. Land Department are working great hardships upon the miners and should be changed or modified. Mining in California has once more come to the front and occupies again the position it should in the commercial world. We hope that you will do all in your power to have your county association elect and send delegates to the coming convention, and in case some of your delegates elected cannot come have them send their proxies to some one else who can attend and who will vote for your interests.

THE Newlands mining bill will come up at the next session of Congress and will be backed by the influence of the California Miners' Association. It is by far a better mining bill than that drawn by Senator Stewart, and which he introduces at every session. There are many objectionable features in Senator Stewart's measure and these have been pointed out to him, but he refuses or neglects to make any changes. These objections are eliminated from the Newlands bill, which has been carefully scrutinized by a special committee of the California Miners' Association. It will be to the advantage of all quartz and drift miners to have this new bill passed at the coming session of Congress.

Concentrates.

THE Ontario mill of Utah has commenced shipping base ore again and several teams are now on the road.

THE Golden Rule mine at Cable Cove, Oregon, has shipped fifty tons of ore to the Everett Smelting Works.

A TWO-FOOT QUARTZ LEDGE has been struck in the Mary Jane gravel mine near Washington, Nevada county. Free gold is shown.

JOHN VAN, late foreman of the White Susan mine, has taken the superintendency of the Cabel or La Bellevue mine at Granite, Oregon.

THE Mt. Lewis cyanide works at Junction Creek, Col., are being enlarged, the process being quite successful with the ores of that vicinity.

H. A. SWIFT is expecting a carload of new machinery at Oroville for his mine at Granite Basin. A new mill and hoisting works are being erected.

THE Smuggler mine at Aspen pays a dividend monthly of $50,000. The Gibson and Argentum J. properties will soon be in shape to resume dividends.

THE Mason Valley *Tidings* says: The Wellington quartz mill is running on ore from the Pin-Hook gold mine, located fourteen miles from the mill.

THE Eureka Lake and South Yuba Canal Co.'s mine at Columbia Hill, Nevada county, operating under the Caminetti law, is running a six-inch monitor.

THERE are reports again of a copper combine, but so far the reports have not been traced to any reliable source. Let the report be as it may; the market remains quiet.

R. J. CAMERON, of Uniontown precinct, Oregon, has bonded his real estate to Messrs. McCarthy and Bailey for $25,000. It comprises a large area of rich mining ground.

THE Virtue mine, Baker City, Or., owned by G. W. Grayson of Oakland, and superintended by John McNally, is proving a steady producer and is making some handsome cleanups.

AT Pine Grove, Nev., the Wilson mine is being worked by lessees. They pay a royalty of fifty per cent and the owners furnish tools and all mine supplies, and mill the ore free of charge.

A STEAM PUMP has commenced to "fork" water from the Live Yankee mine, on the Nevada City road—a short distance from the county seat. T. J. Benney has charge of the property.

THE company which has bonded considerable mining ground on Foots creek, Oregon, have struck bedrock, and the prospects for good pay are excellent. They have over 900 feet of tunnel and are still drifting.

THE camp at Cable Cove, Oregon, is expected to give employment to more men this winter than ever before. The recent sale and bonding of a number of mining properties there have made a prosperous camp.

THE extension of the San Pete Valley R. R. to the Morrison coal mines has been completed. It is expected that the next extension will be to Salt Lake City, so as to bring the coal from the mines to a good market.

THE Anaconda *Standard* devotes a page article to statements from business men refuting the assertion often made that Anaconda is controlled entirely by one corporation and that no one can do business there without their consent.

AT the annual meeting of the Alpha Mining Company 85,565 shares were represented and the following officers elected for the ensuing year: Charles Hirschfeld, president; A. K. P. Harmon, vice-president; and J. Thomas Anderson, A. Jackson and C. C. Harvey, directors. Charles E. Elliot was re-elected secretary, and his financial statement showed a credit of $2452.95 on October 1.

JAMES WALKER left Vanderbilt with four men this week. He has built two arrastras at Goldstone, San Bernardino county, which he intends to run with a gasoline engine. He has four feet of ore which will run $60 to the ton in gold.

ONE of the largest diamond drills on the Pacific coast, capable of boring 4000 feet, has been taken to Port Angeles by an Ohio syndicate and work of prospecting for coal will be commenced. The Ohio men agree to bore to a depth of 1000 feet and develop the coal, if found, in consideration for which they will receive $10,000 and the mineral right on 2000 acres of land.

THERE are many dividend-paying mines in Gilpin county, Col., but no report is to be had from them. The same can be said of San Miguel and Lake counties. Colorado has a long list of profit-paying mines, data from which it is impossible to get. Same way with California. They do not publish anything about dividends out in this State.

THE Red Mountain and Guston mines are not shipping the amount of ore that was expected with the completion of the Walsh smelter at Silvertou. It seems that the smelter requires considerable quartz and silicious ores, now unobtainable; therefore the large output that would be possible from the mines mentioned cannot be treated.—Denver Mining Record.

A BRIGHTER outlook in the iron trade lends cheer to the entire business world, because the iron industry is looked upon as the pulse of general prosperity. At Birmingham, the great Southern iron center, the orders are many and, though for small quantities, keep the output cleaned up. The twelve stacks in operation now are outputting as much iron as over twice that number did in Birmingham some years ago.

AT El Dorado Canyon, Lincoln county, Nev., there is considerable activity. Flood & Co. have twelve men at work on the property which they have bonded. The main shaft is down thirty-five feet, showing four feet of gold ore which assays $45 to the ton. J. Lisle is working a claim adjoining the above property, which also shows good ore. The Southwestern Co. have not done any work for the past few months, but it is expected that they will soon start up again.

GRANT'S PASS claims to be the liveliest town in Oregon. The *Courier* of that place says: "The explanation of this state of affairs lies in the constant stream of gold dust leaving our hillsides for the mints to be coined into the only circulating medium the money-lenders will accept. Those communities depending upon the productions of the field, orchard or stock range are feeling the effects of the lack of demand for wheat, dried fruits, hops, wool and live-stock.

THE inconveniences of surveying in the mountains of Arizona was strikingly instanced by Surveyor Drummond, on his recent contract in northern Arizona. The channel of East Clear creek, in Coconino county, is an unbroken canyon from 300 to 800 feet in depth. The survey party wished to cross to the other side at the line they were running, and had to travel 142 miles to get their horses and supplies to the same section, on the opposite side.—Tucson Citizen.

THE Gold Bronze mine at Vanderbilt, San Bernardino county, is improving daily. The main shaft at a depth of 275 feet has thirty-six inches of ore, which will run from $100 to $200 to the ton in gold. Campbell's mill, which has been idle for ten days, on account of the breakage of the main shaft, is now running again. In the Boomerang shaft, at a depth of 535 feet, the ore will average $45 to the ton in gold. The water supply from this shaft is now adequate to run the mill steadily.

AFTER a prolonged session the board of directors of the Bullion-Beck and Champion Mining Company, of Utah, has let the contract for the concentrating plant, to be erected at once, to Messrs. Fraser & Chalmers. While no figures were made public, it is said that the machinery covered in the contract will call for an expenditure in the neighborhood of $30,000. In addition to this contract there are the construction and materials, all of which will swell the total cost of the plant to about $50,000. It is to be of 200 tons capacity.

IN an action to enforce a mechanic's lien on a mining company's entire property, in which several interveners claimed liens against the same, and one claimed a lien against a portion only, a decree was entered fixing the amount due each claimant, and ordering the entire property to be sold to satisfy the liens. All parties assented to the decree and no motion was made to set aside the sale. It was held that the sale was not void, on the ground that by such sale the person claiming a lien against only a portion of the property shared in the proceeds from property of which his complaint did not give the court jurisdiction.—Sawyer vs. Ryan, 62 Federal Reports, 635.—United States Circuit Court, District of Colorado.

THE gold placers in the Four Mile country, Routt county, Colo., are attracting much attention. The Four Mile placers are situated about sixty miles west of Hahn's Peak, in the neighborhood of where the range of mountains and hills between the Yampa and Snake rivers terminates in what is known as the Iron Springs Divide. On both sides of this divide, especially in the gulches running north, are the Four Mile placers, and the country round about doesn't bear the slightest resemblance to placer ground. Its general appearance would indicate a vast sand bank, and in the early days a prospector panning for gold in this ground would have been considered crazy, but the gold is there all the same. Much prospecting and development has been done along Four Mile and Timber Lake gulches. The method of sluicing is by the Burlap system of boxes, and it is asserted ninety per cent of the gold is caught. Water is scarce, however, and after July 1st little can be done except by dry washing machines, several of which are being used.

An Important Decision.

LONDON, Nov. 8.—In the Chancery Division of the High Court of Justice to-day Justice Romer handed down his decision in the MacArthur-Forrest cyanide of gold extraction process patent litigation.

The action was brought by the owners of the patent against alleged infringers, and the defense was that the process was old and the patent invalid. The decision is against the owners of the patent, and may have considerable effect in America, where the process is also patented and in use.

Cost of Treating Gold Tailings.

In a former article, says the London *Mining Journal*, we showed bow the application of cyanide of potassium to the reduction of gold in tbe tailings of stamp batteries has given an opportunity for remunerative working of mines in whicb the ore is low grade and refractory. But while we there dealt simply with the prospects involved in the development of the cyanide process at present in vogue, there are two other items in the future reduction of working expenses at the gold mines, in the cheapening of the chemical itself, and in the introduction of new means of employing it. In the Transvaal the gold mining industry has been menaced, as our readers know, by the threat of a Government monopoly of cyanide, but this proposal, which would have the most disastrous results on the gold mining industry, has been negatived, at all events for the present. It is not surprising to hear that Mr. MacArthur is opposed very strongly to this contemplated monopoly. While it might lead to an increase of royalty from tbe mines already employing the process, it would certainly act as a check upon the development of gold mining in the many districts of the Transvaal, such as Lydenburg, the Murchison Range and the Vryheid gold fields, where it has as yet hardly been tried, and would tend to accentuate the already strong tendency of investors to turn to Australia rather than Soutb Africa for new gold mining ventures. While there is, however, still the shadow of tbis cyanide monopoly over the Randt, there are other influences at work which should largely reduce the coss of cyanide.

Tbe conversion of an obscure photographic material iuto a commodity of wide iudustrial range—for some 150 tons of cyanide of potassium are now used in the Witwatersrandt mines every month—has, of course, resulted in entirely cbanging tbe machinery of production. In the first place, its effect was, of course, to "boom" prices, but since then English and Scoteb chemical manufacturers have recognized an opening, and have gone in largely for the production of tbe chemical. Germany has sent out nearly a tbousand tons of cyauide to tbe Transvaal this year, whereas a couple of years ago tbe exportation of this chemical practically did not exist. As a consequence, there bas lately been a reduction of some twenty-five per cent in the price of cyanide. This tendency is likely to be strengtbened by the increase in the means of production. Several new furnaces are being built, both in this country and on tbe Continent, wbich will add largely to the supply. Even greater economy is promised by tbe improvement iu tbe method of turning out tbe product. Hitherto cyanide of potassium has been manufactured from yellow prussiate of potash, which is obtained from waste boofs and horns. One can understand tbat the supply of tbis latter material is strictly a limited quantity, and it has, as a matter of fact, not been elastic euough for the great increase in the demand for the finished chemical. Within the few years during which the extraction of gold by cyanide has been practiced the price of yellow prussiate of potash has gone up about ninety per cent, tbe present figure being about 10½d. per pound. Now, however, a new process will be introduced, wbich will dispense with this dear raw material. As to the character of tbis process, details have naturally not been made public, but we understand that an extensive plant is to be erected at Oldbury, near Birmingham—the first place in which aluminum was produced at a moderate price—and it is believed that the cyanide produced can be sold very much below the present rate. Tbere is thus some prospect of important results towards further ecouomy in tbe working expenses of gold mining in this respect.

The introduction of electrolysis into the cyanide plant is, however, expected to carry economy much further. Tbe great merit of the electrical method is that it allows the same results to be obtained with a weak solution of cyanide as are possible ordinarily with strong solutions. Many attempts have been made to perfect a practical electrical process, and there seems room to hope that tbey bave uow been crowned with success. Iu actual work the latest form of the electrolytic process has worked at a cost of 3s. per ounce, treating 3000 tons a montb, whereas tbe best results obtained uuder the ordinary process, without the intervention of the electric current, are not even hoped to be better tban 6d. per ounce above this. With 8000 tons of ore per month, the new process is expected to reduce the cost of working to 2s. 6d. Some saviug is obtained by the use of lead and iron instead of zinc in the prevailing system, but the main economy is due to the lessened consumption of cyanide, as we have described it. If we take the average cost of the cyanide process at 4s., it will be seen that a clear reduction of thirty-seven per cent is promised in the item of gold extraction. If the process is found to be workable upon an extensive scale, it must naturally give a perceptible stimulus to gold mining development in the Witwatersrandt. Several mines are unable to make so much headway as could be wished, owing to the heavy cost of extraction, and tbose that are paying large dividends are likewise on the lookout for some new processes that will reduce their expenses. Directly tbe merits of any such system become recognized, there will not be wanting companies to avail themselves of it as a means of making the industry more profitable. It must not be overlooked that the Transvaal may not be destined to monopolize the attention of investors, as it has done during the past few years, and if there is any real foundation for the reported existence of solid masses of gold in western Australia, the Transvaal companies will have to exercise the greatest economy if they are to keep the industry at its present profitable level.

The Season on the Yukon.

From several articles in the Alaska *News* we glean the following items concerning the past season's work on the gold placers of the Yukon river region:

Joe Ladue is one of the best known men in the Yukon country, having a trading post and a sawmill at Ogilvie, at the mouth of Sixty Mile river. He has resided tbere since 1882, coming out to Juneau the first time in 1888, and this being his second trip. Joe leaves on the steamer for San Francisco, en route for his home in Plattsburg, N. Y., and will return here next March to go into his post. As Mr. Ladue is one of the best posted residents of the Yukon country, his opinion of the mining industry will carry weight with the public and should furnish food for thought for those intending to go in. The following reliable information is gleaned from him:

It is a hard country to get in and out of, and the cold winters and short working season require energy and money to properly outfit and prospect. "I believe that the Yukon country will prove a big gold field, but it requires money to open out many of the deep placers. This season most of tbe newcomers were short of money and inexperienced, and of the 600 who came in last spring, nearly half have gone down tbe river and left the country. They could not find work, and had not the money and experience to successfully prospect. Of the new camps Birch creek ranks first. There are fully 300 miners there and two towns, one named Circle City, as it is under the Arctic Circle. The reports go that the diggings exceed in extent and richness those of Miller creek. Birch Creek is 238 miles from Forty Mile, and has three rich gulches. Those formerly of Juneau who are doing well on claims there are Billy McMoran, Jim White, Tom Edmonds, Charley Brown, Jack Gregor, Pat Keneller, Missouri Bill, J. Stewart. Miner creek, a new find 150 miles above New Klakayhet, a trading post at the month of the Tananah, also shows up very promising.

Dawson, formerly a carpenter here, has bought the raft and horses from Jack Dalton, and will take supplies to Birch creek. There are more claims on Birch creek than on any other, many leaving Forty Mile and vicinity to go there and take up claims, and it now looks as if Birch creek will have more residents than Forty Mile this winter.

There are five or six claims on Miller creek that have panned out big this season. The others have not been opened out yet on account of the deep surface dirt. Among those taking out pay were Frank Cromeau, leading the list by taking out this season $28,000 and selling his half interest in the claim for $5000, making $33,000 all told. He left for his home. Wm. Legget and Peter Wyborg each took $15,000 out of tbeir claim, the former selling out his interest to purchase a claim at Birch creek. He will spend the winter in tbe States.

On Saturday tbe schooner Gertrude arrived from the Chilkat portage with six miners returning from a season's trip into the upper Yukon river country. They were Audrew Slater, Chas. Larsen, O Steveuson, Matt Liusem, Tom Bismo and Mr. Anderson. In an interview with Mr. Stevenson he makes the following statement of their explorations:

"We started from Juneau April 1st. Our first prospecting was on the Hootalinqua, ascending the stream for six miles, but the prospects did uot look encouraging, and we went down to Stewart river and ascended that stream about 200 miles. Returning down 100 miles, we started up McQuestin river, which is a tributary of the Stewart We ascended the river sixty miles, and found it a very swift stream and full of riffles. Leaving this section, we went back up the Hootalinqua and up that stream for 180 miles, where we stopped and mined awbile and then came out. The highest pay we struck on Hootalinqua was $6 per day on scattering bars.

We mined on Stewart river awhile, but with poor success, as the available bars on Stewart are mostly worked out, and high water preveuted us from working the low bars. A party of miners came up from Forty Mile in Jauuary aud took up the richest bars on Stewart. We did some mining on McQuestin river and sunk a shaft, but struck no pay. Returning on a raft they upset aud lost their tools and provisions; and, upsetting a second time, one of the party, an old German who has been on the Yukon for eight or nine years, was drowned. The party came up to our bar on Stewart.

Game seemed to be plentiful in that section, our party killing tbree moose and seeing plenty of bear.

In the Borax Marshes.

The following is an extract from a letter written by Mr. Henry Rhine to the Inyo *Independent*, from the Borax Marsh:

"The Chinamen are all very industrious, rising at half past four, breakfasting at five and going to work immediately thereafter. They retire at about seven P. M., but do not attempt to sleep till about eight, the time being occupied in one continuous jabber. Mr. Chas. Ling, president, showed me over the marsh, or rather a part thereof, this morning, pointing out to me the soda, cotton ball aud crude borax. Of the last named there is a field of about ten acres, which Mr. Ling says is of a very fine quality. At present the company is making borax from the cotton ball. Seven loads of soda and seven loads of cotton ball are cooked together for about eight hours. At five A. M. fire is started under the boiler. This fire is kept up till about nine A. M., or until the water is brought to the boiling point. The soda is then dumped into the boiler and stirred continually by five men with long-handled shovels. After the soda is all dissolved, the mud at the bottom of the boiler is shoveled out. Let me state here that I speak of soda and cotton ball as the terms are used industrially. The soda is some compound of soda and the cotton ball some compound of borax. By the process employed the soda combines with the foreign matter in the cotton ball and liberates borax, which is held in solution in the water. After the mud, which is necessarily thrown in with the soda, is removed, the cotton ball is dumbed into the boiler and the stirring process is renewed. After having been sufficiently stirred, the mud which comes with the cotton ball is shoveled out, and at about three o'clock the boiler is covered over with boards, and the water holding the borax in solution is allowed to settle. The next morning at two o'clock one of the Chinamen gets up and draws the water off, by means of a hose fastened to an opening in the boiler, into large galvanized iron tanks. The mud remaining is drawn off by means of another hole in the opposite side of the boiler. This last mud so drawn off is run off into a large vat or hole in the ground and is afterwards boiled again, yielding a very fine quality of borax. The tanks or crystallizers are about five feet high with a diameter of about five feet at the bottom and four feet at the top. Suspended from iron pipes across the top of the tanks are the hangers. These consist of strips of galvanized iron about fifteen inches wide and about four feet long, twelve to each tank. On these hangers the borax crystallizes, the process requiring about eight days. Each boiling is sufficient to fill two of these tanks, and the yield of borax is about eight to ten sacks. The process of crystallization is more rapid in cold weather than in warm, there being a difference of about two days in the time required in summer and that required in winter. The water remaining in the tanks after crystallization is complete is also run into vats and the sediment remaining after the water has evaporated is given another boiling. The mud shoveled out by the men during the boiling process is not made further use of, but is wheeled off in barrows. The borax crystals are scraped off the hangers and spread on a wooden platform to dry aud afterward to sack. The soda aud cotton ball are hauled to the boiler a distance of about a mile, and it keeps two teams going all day to haul the seven loads each of material and the sagebrush necessary for fuel."

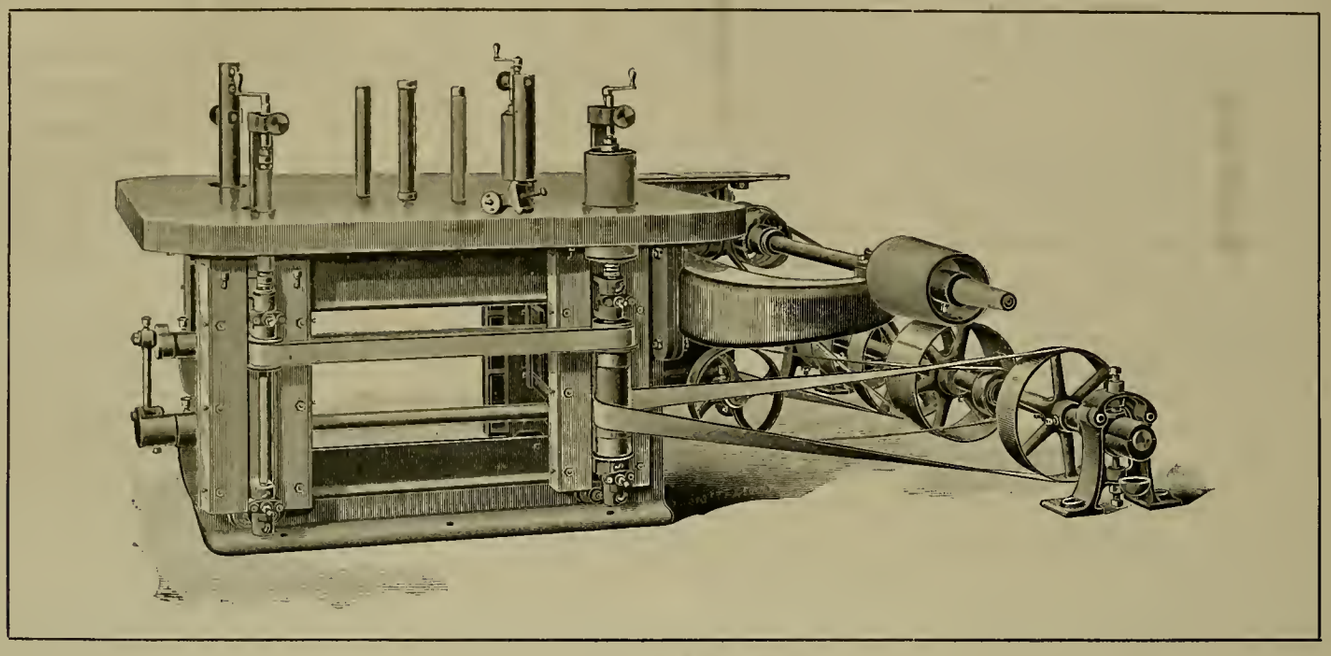
A New Mine Cage.

Alex. Gray, a young mechanic formerly in the employ of the Anaconda company, is the inventor of a patent mine cage, which is now in operation at the Leiter mine at Sheridan. This cage embodies some important features which have hitherto been neglected by mechanics and mining men who have taken an interest in the safety of men underground. The principal feature of the cage, perhaps, is the method adopted to do away with the accidents to life and limb and destruction to property in mines using the old-style chairs. In this cage the chairs are made a portion of the cage, and by a slight pressure of a lever they can be thrown in or out at will. In this cage the station tender can never leave the chairs in, as they fly back as soon as the engine takes the load off of them. They can be used and are very useful in making repairs to the shaft, such as retimbering, etc., as they will rest on any set of timbers, and the men employed in the shaft feel much safer with the cage resting on the chairs than if it was hanging by the rope or cable. Allowing the cage to drop on the chairs at a station is a frequent source of trouble at all the mines of the district as the chairs are now arranged. With this cage the only way damage can be done is by dropping the cage into the sump or by hoisting it into the sheaves. With the old-style cage, the old bottom can be taken off and another bottom with the chairs substituted in about three hours. At the Leiter mine the cage was in running order two and one-half hours from the time work began on the change, and it is claimed that it costs less to substitute the new bottom and chairs than it does to put in an ordinary set of chairs.—Butte Inter-Mountain.

Two Fine Wood-Working Machines.

The illustrations on this page are from the shops of P. Pryibil of New York, manufacturer of wood-working machinery.

The molder is a very heavy machine and is provided with a substantial, removable, outside bearing to the upper cutter-head shaft. It will work moldings on four sides, from ½ to 9 inches wide, and will do any work that can be done on a molding machine.



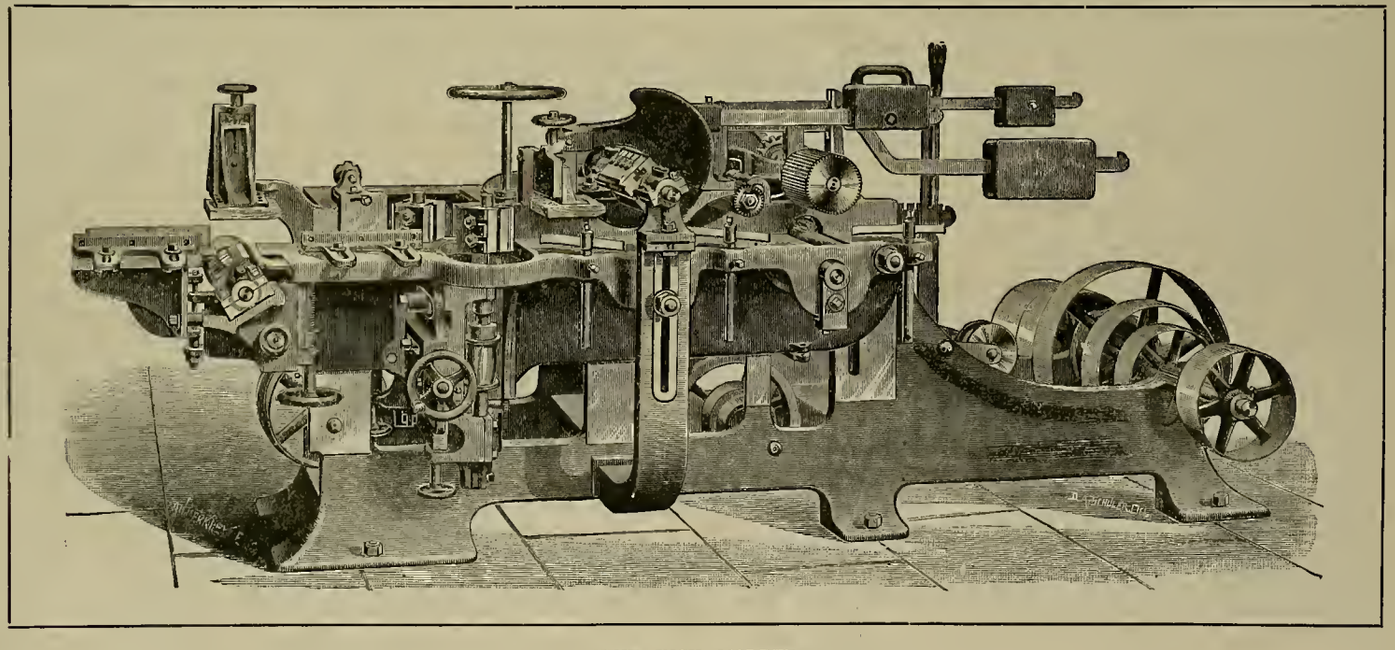
FOUR SPINDLE SANDER.

The side spindles are adjustable vertically and laterally, and the outer one can be inclined to any angle desired, and moved to and from the work without disturbing the angle. The upper cutter-head can be adjusted laterally, and the lower one both laterally and vertically. The feed works are very strong, consisting of three rollers—two above and one below the bed—all connected by a train of powerful expansion gearing, which will allow the bed to drop to take in eight inches. By disconnecting the gearing and working the upper rolls, ten inches thick can be planed. The arbors and cutter-heads are of forged steel, and the latter have four slots. The machine has adjustable chip-breakers, pressure bars, springs and guide, and everything necessary for quick adjustment. The tight and loose pulleys are 14 inches diameter, 7-inch face, and should make about 900 turns per minute. Weight, with counter-shaft, about 3850 pounds.

The sander is intended to do all kinds of sanding. It is provided with the following combination, all parts of which can be operated at once and used simultaneously if desired, thus giving room for several operators to work together.

1. A horizontal drum, with an adjustable table, for flat work.
2. Three free drums with diameters of 1½, 3 and 5½ inches.
3. Four upright drums of ½ to 6 inches diameter.

The upright drums are all in operation at once, at different speeds suited to their diameter, and they thus provide for sanding to the best advantage, curves of different sizes on the one piece of work and with one handling. The upright drums move slowly up and down while revolving, to prevent the formation of streaks in the work. The counter-shaft has twelve-inch self-oiling tight and loose pulleys for a six-inch belt, and should make about 328 turns per minute. Weight, about 4400 pounds.



NINE INCH MOLDER.

The Atkins Process.

The Atkins process is a method discovered about a year ago for the treatment of gold and silver ores by electrolysis and amalgamation. A plant is now in operation at Ipswich, England, where commercial tests have been made showing it to be practical and recovering over ninty-five per cent of the assay value.

The plant comprises one 18-horse power engine, five-stamp battery, four-horse power dynamo, electrical amalgamator, pan and settler. The only chemical necessary is a solution of common salt of one-half per cent strength, which is fed into the battery with the ore. The electric current decomposes the salt, liberating chlorine at the positive pole and forming a sodium amalgam with the quicksilver at the negative pole. In this way gold is in a finely divided condition and is chloridized and afterwards deposited in the quicksilver.

The sulphides and chlorides of silver are decomposed by the sodium and hydrogen formed at the negative pole. The silver is thus liberated in contact with the quicksilver and amalgamated. The process is capable of treating auriferous pyrites and sulphureted silver ores without previous roasting. Eminent metallurgists who have examined the method speak very highly of it and do not hesitate in recommending it.

Those who have visited the plant while in operation say it is very simple, being merely a five-stamp battery from which a spout carries the pulverized ore and salt solution into a vertical steel cylinder, inside of which is a revolving carbon shaft and a quantity of quicksilver. The pulp passes from this to a revolving horizontal cylinder and thence to the pan and settler. Nearly all the mineral that ha escaped from the cylinders is recovered it th settler.

The main cost of treatment is that of crushing the ore, the quicksilver being used over and over again with but a fraction of the loss accuring in ordinary plate or table amalgamation.

The Deadwood *Times* says a quantity of Black Hills ore has been shipped to England for treatment by this process, and if the result is successful it will be adopted in some new works to be constructed in that section.

Notes on the Gold-Bearing Black Sands of California.

NUMBER I.

Written for the MINING AND SCIENTIFIC PRESS by J. A. Edman.

TO THE EDITOR:—The recent article by Mr. Almarin B. Paul, in your issue of October 13th, as well as your extracts from Mr. Keeler's paper in the San Francisco *Bulletin*, came very timely to remind Californians of the as yet very much neglected opportunities to be found in a systematic working of the beach sands, as well as the heavy sands from the deep gravels, generally present in varying proportions in the tailings from placer mines, including hydraulic and drift mines. My own experience during some years of close investigation of the waste products of placer mining, generally confirms the conclusions of Mr. Paul, and having lately been enriched by a study of the beach sands, may serve to supplement Mr. Keeler's observations, and throw light upon the difficult problem of successful beach mining.

For convenience of description the black sands of the coast and estuaries will be referred to as *beach sands*, while the heavy sands of the placer and gravel mines will be treated of as *stream sands*. They vary much in color, from a deep black to a gray or greenish gray, but are popularly referred to as *black sands*.

Ever since the great excitement attending the discovery of gold at Gold Bluff, Humboldt county, in the spring of 1851, beach mining has been prosecuted at that locality and at various points of California's coast from the Oregon line to Lower California, but only at the first mentioned place on a large scale and with economic success. Desultory work has been done in San Francisco bay; at and near the Cliff House; at Santa Cruz; on the coast line between Point Sal and Point Conception; and at Tia Juana, south of San Diego. At present the beach mining industry is nearly at a standstill and is chiefly prosecuted at Gold Bluffs and Big Lagoon.

The beach mines of Oregon were formerly very prolific, particularly at Ophir beach near Rogue river, and at the town of Randolph, but have since declined, and are now seldom heard from.*

Broadly speaking, the origin of California's beach deposits may be traced to the two great drainage systems of the Klamath and Sacramento rivers, the former furnishing the beaches from Oregon to San Francisco bay, while the latter has brought to the coast the material for the deposits as far south as Santa Cruz, and the gold-bearing rocks of the coast ranges have enriched the unimportant beaches farther south. The immense gravel banks fronting the ocean near Gold Bluff are readily traced to the benches along the Klamath river, which extend nearly unbroken for a hundred miles from the coast, and of late years have become the scene of active and profitable hydraulic mining. This enormous mass of gold-bearing material has for ages been undermined by the ocean and subjected to Nature's concentration on a grand scale, and by ocean currents carried south, leaving a portion of the gold with other heavy minerals accessible to the miner on the surface of the beaches. In contrast to this feature, the material eroded by the Sacramento river and its branches has been deposited in the great basin of the Sacramento valley, and comparatively little of its gold has found its way to the sea. On both sides of the Straits of Carquinez the remnants of auriferous bars and beaches are yet found, and one of the most interesting samples of rich beach sand was taken years ago, before the building of the railroad from Martinez, at the foot of the bluff about half a mile from that town. Within the last decade the sands from a bar below Benicia have been worked for gold with moderate returns. The color of gold can be found by careful panning at many points on the shores of San Pablo and San Francisco bays.

The physical characteristics of the beach sands will, as with gold ores in general, determine the true methods of treatment, for which purpose a detailed description will be given of the Gold Bluff sands as typical in most respects of the beaches of our northern coast, and as determined by analysis, assays and microscopical inspection. The naturally or artificially concentrated sands are nearly black and of a specific gravity approaching 5.00, and consist of grains of an average size of 1-70 inch, mainly of the following minerals:

	Specific Gravity.	Hardness.
Magnetite (pure)	5.20	5.5–6.5
Titaniferous Magnetite	4.80–5.00	5 –6
Ilmenite	4.75	5 –6
Chromite	4.46	5.5
Hematite	5.30	5.5–6.5
Zircon	4.45	7.5

The first five minerals form the bulk of the sands and are black or nearly so. They may be classed as: Magnetic—Magnetite and titaniferous magnetite; Magnetic in part—Ilmenite and chromite; Non-magnetic—Hematite and zircon.

The zircons are here generally transparent and colorless, but also pink, red and yellow, and contain many inclusions.

Associated with the above are garnet, spinel titanite, olivine, epidot, and, rarely, cassiterite or tinstone.

Of metallic minerals are found gold, platiuum aud iridosmium, the last two metals being less in weight than two per cent of the gold. The gold is in thin scales, often bent and douhled up, with the edges generally slightly turned over. The surfaces of the scales are much pitted and sometimes quite crystalline, as when acted upon by acid. Nearly ten per cent of the scales have a semi-transpareut coating of brown or black oxides of iron and manganese. In size the gold measures from 1-250 to 1-80 inch, averaging 1-120 inch; a few scales were found up to 1-25 inch. In thickness the scales run from 1-10000 to 1-2500 inch, averaging 1-5000 inch.

The platinum corresponds in size and shape with the gold. The iridosmium is almost lead-gray, in thin crystalline flakes.

Somewhat more than fifty per cent of the saud is worn to smooth and rounded grains, while much of the iron minerals are in angular and slightly worn fragments. A large part of the zircons shows but little abrasion and presents sharp edges and corners. Most of the silicates are in rounded grains.

In gold contents the above sands vary from twenty to one hundred and fifteen dollars per ton of material of specific gravity 5.00. The methods generally in use on California beaches have failed to give a reasonable percentage of extraction, and no economically practicahle system has yet been devised. Simple inspection of the gold should convince the beach miner that amalgamation on plates, in a free running stream of water, will under the best conditions save only the larger particles. Blankets, or other rough surfaces, will largely increase the yield, but fire up with the heavy sand. Magnetic separation will undoubtedly be required as a step in the treatment, which of necessity will be somewhat complicated, but not necessarily expensive. Ou an average, from 60 to 70 per cent of the Gold Bluff sand can he separated by the magnet, leaving the valuable metals in the non-magnetic sands of ilmenite, chromite, hematite and zircons. Such magnetic separation should be on the dry sands, as iu the water they form a compact mass from which the gold cannot be settled, even by strong percussion. These sauds and the gold in them have a strong tendency to float on the water, after being momentarily exposed to the air—a fact which increases the loss iu treatmeut.

From the non-magnetic sand the gold could bc recovered by grinding and amalgamatiou, and a still better result would follow from barrel chlorination. Cyanide treatment would under most couditions be successful, but this gold, although so attenuated, requires a longer time for solution than gold ores in general.

As wave action cannot he depended upou for continuous work in concentration, a scheme for artificial concentration of the poor beach sands must be devised before this industry cau hope for permanency. This should not be difficult, as percussiou tables or belt concentrators properly handled would effect the object. Among belt machines, the Johnston coucentrator seems well fitted for the purpose, if care is taken to feed evenly and slowly.

The above suggestions are made, not as parts of a perfect scheme, but as aids to the investigator, although based upon many tests ou a small scale.

The beach sands of Santa Cruz prescnt almost identical features with those above described, except being smoother and of finer grain, with perhaps a greater percentage of light-colored minerals. The gold contents are insignificant. The smoothest, most rounded and lustrous sands occur near Martiuez, as above noted, where the gold particles are thicker and exceedingly high-colored, clean and bright. This sand forms beautiful mounts for the microscope.

Of late years the original auriferous deposits in the Straits of Carquinez and San Pablo bay have become covered by recent medium heavy sands brought down by the Sacramento river, consisting of the lighter varieties of magnetite and fluorite, with much hornblende and mica, with only an occasional color of gold.

The hopes entertained by Mr. Keeler and mauy others of obtaining a valuable by-product in the working of black sands, from utilizing the iron sand as an ore, will scarcely be realized on the coast of California and Oregon.

While large deposits of pure non-auriferous magnetite sands exist in various countries, as for instance on the coast of Labrador and in Australia, and are excellently fitted for the production of a superior iron, and although local deposits of finely divided or granular magnetite are found in the interior of California, and have been distributed into most of the ancient and recent gravel deposits during ages of erosion, the bulk of the iron sauds both of California's beaches and deep gravel channels consist of the various kinds of titaniferous iron and magnetic chromites, which are entirely unfit for smelting, being almost infusible, as most iron smelters have fouud by experieuce fully tweuty years ago. Using magnetic separation on the beach sands, less than thirty per cent ou an average will be pure magnetic iron, while the balance of titaniferous irou and chromite will vitiate the usefulness of the magnetite. Great and easily accessible ledges of compact titaniferous iron ores exist in the State of New York as well as in Canada, but are shunned by American ironmasters, while magnetite separation on granular or impure hematites and magnetites has become firmly established in the Eastern States.

Meadow Valley, Plumas Co., Cal.

*For detailed information on beach mining localities the reader is referred to the 9th Annual Report of State Mineralogist, page 35; 10th Report, page 545; 11th Report, pages 227-232. Valuable data on beach mining in Oregon are found in Lock's Practical Gold Mining, pages 215-222.

Hydraulic Mining from a Valley Standpoint.

For more than twenty years the mines conducted by the hydraulic process in the Second Congressional district of this State have been a source of trouble and litigation. Two years ago an act was passed by Congress providing that the question should he placed in the hands of a Commission composed of engineers of the United States Army, with authority to place such mining under their control. Competeut engineers were appointed and the gentlemen have since that time been actively engaged in the performance of the duties imposed by the law.

The fact stares us in the face and we may as well admit it, that the sentiment in favor of permitting hydraulic mining to be resumed is growing, not only in California, but in the States on the Atlantic side. In our candid judgment the condition of this question is iu better shape than we can get it again if we reopen the litigation and amend the law in any of its priucipal points. I am aware that there are men of influence on both sides who would be pleased to see the United States Commission knocked out and the old state of things brought back so they may thrive. Of course there are but few of them and they can be placed in one list, to be termed the hog in the hydraulic controversy.

The Sacramento *Record-Union* in a recent editorial apparently takes issue with the law and the United States Commissioners, declaring that the system of dams thus constructed will simply amount to a waste of money; and to prove that it has argument on its side refers to the Parks dam of years ago, which, in fact, was a mere brush fence laid in the sand with the tops pointing up stream. The *Record-Union* is not the first journal to take issue with the Government engiueers and to undertake to teach them a lesson in the art of constructing restraining dams, as the Sutter *Independent* has harped on it many times. But the strange part of the business with these wise jouruals is that the only remedy suggested is to cease workiug mines by the hydraulic process, which would, if undertaken, reopen the litigation and cause the expenditure of hundreds of thousands of dollars. And when we consider the advance made by the Commissioners in so short a time, it seems strange indeed that there is one journal in the State that should refuse support uutil a fair trial is had, which the law certainly has not.—Marysville Democrat.

Harqua Hala Gold Mining Company.

The directors have issued their first annual report and accounts for the period from June 12, 1893, to June 30, 1894. The revenue account shows a credit balance of £31,682 13s. 2d. as the result of active milling operations during a little more than eight months' working. From this sum two dividends have been paid of 9d. and 6d. per share respectively, and since the closing of the accounts a further dividend of 9d. per share, making a tota distribution for the year of £29,000, or 2s. per share, being at the rate of ten per cent per annum on the capital. All initial legal expenses, together with Captain Plummer's fee for inspecting and reporting upon the property, have been defrayed out of reveuue. The commission due to the American Company under the working agreement has been provided for, and the board have set aside £1000 for depreciation and renewal of plant and machinery, leaving a balance of £776 13s. 6d. to be carried to the next account. The expenditure upon capital account has been £7922, and the balance of capital unexpended, including the amount retained under agreement with the American Company, is £13,436. The cost of the new shaft, £1533 19s. 9d., has been charged to capital account. It became necessary, owing to the dangerous condition of the old shaft, to suspend milling operations for three mouths, pendiug the completion of the new shaft. This stoppage, and the accident to the hoiler in July, account for the period of nearly four months during which no milling was done. Development work has been continuously aud vigorously prosecuted, but with results, as regards the Bonanza group, so far disappointing, the size and value of the veins apparently diminishiug with the depth reached, aud the drifts into the adjoining ground showing little or no value. At the Golden Eagle group developments have resulted more satisfactorily. Mr. Allen, the manager, estimates the reserves of ore at 30,000 tons, but explains that the irregularities of the vein system

make it difficult to arrive at conclusions in the matter with accuraey, and the figure named is, therefore, probably a moderate one. The question of the treatment of tailings has engaged attention, and the board await the results of experiments made with the Kendall process before deciding upon the steps to be taken.—London Mining Journal.

Electrical Precipitation From Cyanide Solution.

The Siemens-Halske Gold Recovery Process.

At a meeting of the Chemical and Metallurgical Society of South Africa, recently held, Mr. A. Von Gernet read the following paper upon the Siemens and Halske gold reeovery process, which has been tried on a large scale at the Worcester mine for four months, after long and exhaustive preliminary experiments at the works of the Rand Central Ore Reduction Company. Mr. Von Gernet said:—

Although the electrical preeipitation of gold, extracted from ores by cyanide, has only been recently introduced into South Africa, it has been in use in Europe and Asia as far back as 1888. The author having been connected with the process from the beginning, he is thereby enabled to give some information concerning its development, based on actual working data, which may be of general interest. In 1887 Dr. Siemens found that the gold anodes used in electroplating at his works in Berlin lost weight when standing idle in the cyanide liquor without any electric current passing through the bath. This fact, baeked by the statements of chemical authorities that gold is soluble in cyanide, first induced him to try the use of cyanide solution to extract gold from ores. In the same year he built a small plant to make experiments on concentrates produced at Siebenburgen. The gold was precipitated from the solution both by electrolysis and with zinc filings. It was found, however, that the zinc method gave good results with strong solutions ouly, while the electric precipitation was equally effective with either strong or weak solutions, and its efficiency was not lessened by the presenee of caustic soda. Dr. Siemens therefore decided to use electrolysis only. Early in the year 1888 he commenced operations on a larger scale, and engineers were sent out to several different countries. Two went to Hungary, another to America, and the author to Siberia. The results obtained were generally satisfactory, although, as might be expected, they varied considerably, owing to the different conditions existing in the respective places. Nothing was done in this country at that time as the patent question was not then settled Except to mention the fact that Mr. Siemens was the applicant for and holder of the first patent in the Transvaal for the extraction of gold by means of cyanide, it is not necessary to discuss this matter, as such questions are beyond the scope of a technical paper, It would be superfluous to explain the elementary principles of electrolysis to the members of this Society, but it is necessary to point out some of the reasons why such a large number of electrolytic processes have not succeeded commercially, the outout from them having been larger in profanity than in gold. As you are aware, the electric current decomposes a solution of a metallic salt, the metal being deposited on the negative pole, while the metalloid is liberated at the positive pole of the electrolytic cell. In a fixed time a given electric current will deposit a certain quantity of metal, which quantity varies for different metals in direct proportion to their electro-chemical equivalents.

This law holds good only for solutions strong in metal, but with very dilute solutious, as in use in the cyanide process, the current does not find sufficient of the metallic compound present at the electrodes, and consequently decomposition of water also takes place. For this reason, to make the efficiency of the precipitation as great as possible, constant diffusion of the solution is requisite. In order, therefore, to create an artificial diffusion, a mechanical movement of the solution is important, and the most economical and convenient way of effecting this is to allow a slow but steady flow through the precipitation boxes. But it is still most important to give a very large surface to the electrodes. In fact a better effect is obtained by doubling the number of plates than by increasing the current tenfold. For this reason it will be seen that mercury cathodes cannot be used with good results. In order to precipitate 100 tons of cyanide solution containing five dwt. of gold per ton, in twenty-four hours, about 10,000 square feet of surface is required. If the bottom of the precipation boxes were covered with mercury, it would be necessary to have it at least a quarter of an inch deep, to make up for difference of level, and thus ensure that the whole surface should be covered. This requires over 200 cubic feet of mercury, weighing eighty tons. Not only the initial expense, but also the trouble in cleaning up makes the use of mercury in this way as an electrode impracticable. The vertical position in which metallic plates can be placed has the great advantage of keeping the surface of the cathodes clean, as any solid matter entering the boxes in suspension sinks to the bottom of the latter, no obstruction being offered to its downward course. Sheets of solid metal (as copper) coated with mercury have also been tried, but have been unsuccessful, because the mercury, owing to the action of the current, will penetrate the copper and form a dry amalgam, which does not adhere to the plate. To obtain a satisfactory cathode a metal must be used which will fulfill the following condition:—

1. The precipitated gold must adhere to it.
2. It must be capable of beiug rolled out into very thiu sheets to avoid uunecessary expense.
3. It must be easy to recover the gold from it.
4. It must not be more electropositive than the anode, in order to prevent return currents beiug generated when the depositing current is stopped.

The most suitable metal for the purpose is lead, which is therefore used in the Siemens' process, and which meets all the requirements of the case. Not less important is the question of anodes. By the action of the current a metalloid is liberated at the positive eleetrode, aud the latter, when a metal, begins to oxidize. Carbon could be used as an anode, but it will not withstand the action of the current, and soon crumbles into a powder, which decomposes cyanide. This finely divided carbon is in suspension, and cannot be removed from the solution by filtration. Zinc used as an anode forms a white precipitate of ferro-cyanide of zinc by the reaction of zinc oxide upon ferro-cyanide formed during the leaching. Similarly iron anodes form Prussian blue by the reaction of oxide of iron and ferro-cyanide. In consequence of this reaction the amount of ferro-cyanide in the cyanide solution does not increase. From the Prussian blue the cyauide can bc recovered by dissolving it in eaustic soda, then evaporating the solution, and fiually smelting with potassium carbonate.

This last process has been carried out only on a small scale, about fifty pounds at a time, but a nice clean cyanide potassium was obtained. In the treatment of tailings this regeneration of cyanide is not of great importance, but with concentrates, which decompose the solution with formation of ferro-cyanide, it will effect a eonsiderable economy. In order to precipitate the gold from cyanide solutions only a very weak current is required; that is to say, a density of about 0.6 ampere per square foot. With eathodes about one aud one-half inch apart, four volts are sufficient to produce this current strength. The advantages gained by using a weak current are:

1. The gold is deposited hard on the plates.
2. The iron anodes are preserved for a long time, as their waste is iu proportion to their current strength. In a plaut treating 3000 tons per month, 1080 pounds of iron are destroyed in that period.
3. Little power is required; 746 Watts equal one horse power. A 3000-ton plant requires 2400 Watts, equal, theoretically, to three and one-half horse power, and actually requiring about five indicated horse power.

The most important feature of electrical precipitation is that it operates on the solution quite independently of the amount of cyanide or caustic soda that it contains. Precipitation by means of a chemical reaction is invariably more complete with a solution strong in cyanide than with a weak one; but with electricity it is absolutely of no importance whatever. Therefore, in the treatment of tailings very dilute solutious can be used, the only limit being a certain amount of cyanide to dissolve the gold satisfactorily. Moreover, however acid the solution may be, when entering the boxes the precipitatiou takes place equally well, the same amount of gold being recovered as from a neutral or alkaline solution. There are none of the complications arising from the formation of lime aud alumina and hydrate of irou, which, under similar circumstances, sometimes occasion so much trouble in the zinc process. Every one here present is aware that a solution containing .03 of cyanide will dissolve gold just as effectively as a solution containing .3 per cent, provided a longer time is allowed for treatment. In the first case the decomposition of cyanide in the tailings is much less than in the second, and a corresponding econony is effected. The moisture in the original tailings being usually about the same as that contained in the residues, there is, as a rule, no chance to give a large water wash after the cyanide treatment is finished. The residue discharged contains ten to fifteen per cent moisture, carrying about .1 to .05 per cent cyanide solution when the zinc process is employed. This is equivalent to one-quarter pound of cyanide per ton of tailings. This loss may be reduced to ouefortieth pound by using as weak wash a solution containing .01 per cent cyanide, which strength will be perfectly suitable for electrical precipitation, though difficult to deal with by the chemical method.

Having described the principles involved in this process, it only remains to give some details as to the practical working results obtained at the Worcester works. There are now in use five leaching vats of two feet in diameter with ten-foot staves, each holding 2700 cubic feet. One tank is discharged and filled every day. The strong solution used contains from .05 to .08 per cent cyanide and the weak washes .01 per cent. The actual extraction of fine gold has averaged 70 per ccnt, while the consumption of cyanide has beeu one-fourth pound per tou of tailings treated. The precipitation plant consists of four boxes 20x8x4 feet. Copper wires are fixed along the top of the sides of the boxes, and convey the current from the dynamo to the electrodes. The anodes are iron plates seven feet long, three feet wide and one-eighth inch thick. They stand on wooden strips placed on the bottom of the box, and are kept in vertical position by wooden strips fixed to its sides. In order to effect circulation in solutions passing through the box, some of the iron sheets rest right down on the bottom, while others are raised about one ineh above the level of the solution, thus forming a series of compartments, similar to those of a zinc box, the difference being that the solution passes alternately up and down through successive compartments. The sheets are covered with canvas to prevent short circuit. The lead sheets are stretched between two iron wires, fixed in a light wooden frame, which is then suspended between the iron plates. The boxes are kept locked, being opened ouce a month for the purpose of the "clean-up," which is carried out in the following mauner:

The frames carrying the lead cathodes are taken out one at a tiuc. The lead is removed and replaced by a fresh sheet, and the frame returued to the box, the whole operation taking but a few minutes for each frame. By this means the ordinary working is not interrupted at all, and the cleaning out of the boxes, which is necessary in the zinc process, is only required at very long intervals. The lead, which contains from two to twelve per cent of gold, is then melted into bars and cupelled. The consumption of lead is 750 pounds per month, equal to 1½d per ton of tailings. The working expeuses, including filling and discharging tanks, come to 3s per ton. When working on a larger scale, the expenses will, of course, be reduced. After the facts mentioned in this paper, it will no doubt be conceded that electrical precipitation has emerged from its experimental infancy and growu up into a healthy manhood, and proved itself to be a techuical aud commercial success, and that it is in every respect at least as good a method of precipitation as the zinc process. Auyway, it exists as a tangible fact, which canuot be explained away by argument or ignored by commercial meu who require the best at the cheapest rate. It is to be regretted that the time available has uot allowed such a fully detailed account as could be wished, but sufficient has been said and figures enough given to place the Siemens and Halske process within the category of practical precipitants of gold from cyanide solutions.

In the course of the short discussion which ensued it was stated that the costs at the Worcester worked out as follows: Filling and discharging, 10d. per ton; cyanide, 6d.; lime, 1.2d.; caustic soda, 5d.; lead, 1.1d.; iron, 2.2d.; native wages and food, 1.9d.; coal, 4.6d.; white labor, 4.6d.; stores aud general charges, 3.2d.—total, 3s.

Mr. Butters observed that the charges for white labor, *viz.*, 5d. per tou, were very high. They were only treating at the Worcester 100 tons per day. If they were treating 8000 tons per month instead of 3000 tons, the cost would be the same, and white labor should ouly be one-fifth of the present charge. The high rates were for white labor and coal. Coal would be nearly constant for additional plant; but while white labor would not be constant with a larger plant, coal would perhaps be a penny cheaper, and white labor would come down to a penny per ton instead of 5d. That meant a saving of 4d. per ton in larger works. In the case of MacArthur-Forrest process, the cost of zinc came to 2½d. on every ton. The new process had lead and iron and coal as heavy items against cyanide, zinc and coal in the MacArthur-Forrest process. Mr. Von Gernet had taken iron at 2.2d., but he had written the cost off by depreciation in one ycar; whereas it would last probably for three years, but all the costs they had taken at the outside. They thought the total cost would come down to 2s. 6d. per ton with an ordinary cyanide plant of from 6000 to 8000 tons per month. Of course, the gain of the process was in the lesser cost of the cyanide. Anybody could work at 4s. per ton, but they thought they could reduce that by 1s., or maybe 1s. 6d. If they could briug down the cost to 2s. there would be an enormous gain. As the boxes had only to be opened once a month, that represented a great advantage in various ways.

Mr. Lioucl Phillips, President of the Chamber of Mines, who occupied the chair, said the facts revealed in the paper were of a startling nature, and of the utmost importance to the mining industry.

Mr. Butters said that as for the royalty to bc demanded, he and probably his board, would be content with one of three per cent; lower rather than higher than that figure.

In accordance with the agreement recently entered into between the Bullion-Beck and Almo mining companies, of Utah, the development of the latter group has commenced in earnest. The members of the Almo company say they are certain that the main ore body of the Beck passes directly into their property and that the payments on the contract can easily be made within the next two or three months. The Almo people are to receive $150,000, payments to be made in installments equal to one-half of the net proceeds of sales of ore taken from the Almo ground, the Bullion-Beck Company to do all the regular development work. Each faction is to be represented by one agent, the two to choose a third as referee in case of a disagreement.

Electrical Progress.

Electrical Progress in the South.

A very interesting article on electrical development in the Southeru States appears in the current issue of the *Manufacturers' Record*. A brief abstract of the article follows:

The greatest wealth creator which this age or any other has ever knowu is rapid transit in the shape of electric or cable railways. As to the amount of rapid railroad building which the South has accomplished within a few years, the city of Baltimorc furuishes a most notable illustration. Three years ago every one of its street-car liues was operated by horse power, with the exception of one mile of electric road iu the northeru part of the city. At present horses are used on but one road in the city limits, and hy 1895 this will be rebuilt for electric operatiou. Since the date mentioned about 220 miles of track have been laid in and near the city for cable and electric motive power, on which about 600 electric or cable cars are operated, aud which require the power geuerated in nine large stations. These figures will give merely an idea of the investmcnt of capital in Baltimore alone in the street railroad business within three years.

But to show how generally Southern cities are provided with rapid transit facilities, the *Record* prints a list of sixty-two cities, all of which have oue or more electric lines.

In most of these cities the power plants, quality of roadbed and rolliug stock will compare favorably with the systems iu any of the municipalities in the country. Taking Atlanta for example, not a horse car is to be seen on its thoroughfares. The electric lines connect the business and manufacturing centers, hotels, railroad depots, theaters and churches with the priucipal resideuce sections in and beyond the city limits. On the Consolidated lines, which coutrol sixty-four miles of track, the rolling stock is from the best makers iu the couutry, such as the Pullman, Brill and Stephenson Works, while Corliss engines of the most modern type furuish the generatiug power.

Next to Baltimore, the city of New Orleans, La., has been the sceue of more electrical construction thau any other point in the South. Fully 100 miles of track will he completed by the end of this year. As in Baltimore, animal power was used exclusively in the city up to two years ago, with the exception of oue or two sections in the outskirts, on which steam dummies were operated. The New Orleans Traction Company, Canal & Claiborne Company, New Orleans & Carrollton Compauy, Orleans Company and St. Charles Street Railway Company have all let contracts for electric equipment. These corporations combined own 150 miles of road. Two of the companies have lines now operated hy motors. From January 1, 1893, to September 1, 1894, 391½ miles of electric railway were completed in Southern States. About 126 miles of electric railway are projected and under construction. The investmeut in these Southern rapid transit systems has found much favor in the North, and it is safe to say that over fifty per cent of the mileage has heen built by outside capital. A few instances of these investments may he cited. At Baltimore the Elkins-Widener syndicate of Philadelphia coutrols the Baltimore Traction Company's roads. The Lake Roland Elevated system, twenty-two miles long, was the result largely of capital placed through the Jarvis-Conkliu Mortgage Trust Company of Kansas City. The president and oue of the heaviest stockholders of the City and Suburban system is Nelson Perin, originally from the West. Murray Verner, the Pittsburg street railway operator, is building one of the Norfolk electric lines. Boston capitalists hold most of the bonds issued hy the Atlanta Consolidated Railway Company. The Jarvis-Conklin Company practically built Augusta's railway. New York baukers are heavily interested in several of the New Orleans lines heing supplied with rapid trausit facilities.

Up to January 1, 1893, 296 electric power stations for motor and lighting purposes were built in the South hy companies whose aggregate capital stock is $19,891,000. Since the time specified, the *Manufacturers' Record* shows that 166 plants have beeu completed or are in course of construction. These include the station of the Brush Electric Light Company, which replaces one burned, and which is valued at over $1,000,000; also the station of the Baltimore & Ohio Railroad Compauy for operating electric locomotives hy the trolley system. These plants represent capital stock of fully $15,000,000, making a grand total of 461 stations controlled by companies capitalized at $35,000,000.

This is what the South has done in the adoption of electricity as one of the great factors in its progress.

Transmission of Power.

The *Electrical World* says: Mr. Guilbert publishes in *La Lum. Elec.* a profusely illustrated description of a novel continuous alternating current trausmission system which has been iu regular operation for several months iu transmitting power from La Chapelle to Epinay, the inventiou of Messrs. Hutin aud Leblanc. In this plant a low tension, contiuuous curreut is couverted into a high tensiou three-phase alternating curreut by the machine called a "pauchahuteur;" these are transmitted over the linc and iu a similar machine are again transformed down to a continuous low tension curreut and used for charging accumulators for lightiug a railway statiou; the original coutinuous current voltage is between 110 and 170, the alternating current voltage is between 4000 and 5000, the line currents about one ampere, the distance almost five miles and the final voltage about the same as the original; the original curreut is from sixty to seventy amperes, and the final curreut from forty to fifty; the efficiency of the trausmission without consideriug the liue loss is hetween seventy-five and seveuty-eight per cent for about 12.5 kilowatts delivered at the farther end; iucluding the line losses, the total efficiency of the plant appears to be about sixty to sixty-eight per cent; it is believed that by making changes and improvements in the apparatus, the efficiency can be increased to ninety per ceut; the important loss of energy is that iu the motors, which can he greatly reduced if desired. The general principle of the transforming machines, which are similar to each other, is that the continuous current is transformed into a tri-phase alterуating current by means of a commutator driven by a motor, these currents being theu transformed into high tension currents. The article contains twenty illustrations showing the couections in the apparatus, several external views aud a large number of curves of efficieucies under various couditions. The receiving apparatus is driven by a synchronous motor, absolute synchronism being obtained by a special device; the moving of the brushes for different loads is accomplished automatically and there is said to be no sparking; the motor does not start hy itself, hut it is said that a few turns by hand are sufficieut; even this difficulty, however, can be overcome; it is helieved that the apparatus can be simplified very greatly, this being the first installation; he helieves this system can he used with success for considerably increasing the carrying capacity of feeders. Several tables giviug quite complete experimental data under various conditions are included.

The Storage Battery Problem.

At a recent meeting of the American Institute of Electrical Engineers, in Philadelphia, Mr. W. W. Griscom read a paper dealing with the storage battery problem. After devotiug a great deal of time to a recital of many phenomena which he had encountered in his study of the question, he said: "Perhaps the most striking peculiarity about the moderu storage hattery is the diversity of opinion among professional electricians as to its utility and commercial value. Men of the highest rank as electricians and engineers are ranged on either side of the question. Men of affairs, who have put them to a commercial test, exhibit a like divergeuce of views. Broadly stated, the European consensus of opinion, both technical aud commercial, may be said to be in favor of storage batteries. The American view until now has been mainly the opposite. What is the ground for this wide discrepancy? Why is cautious, conservative Europe so far ahead? Why is America a laggard in the running? The answer is not far to seek. Storage batteries are almost always an economical success abroad, while here they have been too often an economical failure in the past. And the reason is that the European always demands a margin for safety, while the American, with less capital aud keener competition, is temped to sail too close to the wiud. A storage battery continually worked to its commercial rating is a commercial failure. A storage battery worked sufficiently within its capacity is invariably a commercial success."

Electrically Operated Machine Tools.

At the engineering works of Messrs. de Wendel & Co., at Hayingen, Lorraiue, where merchant iron of great length is produced, a portable electric shearing machine has recently been put in operation. The shearing machine is of the ordinary type, driven by a "Henrion" motor, made by Fabius Henrion, of Nancy, France, takiug 75 amperes at 1.0 volt, and runuing at a speed of 800 revolutions. Both motor and shearing machine are mounted on a flat truck, running on rails. The same motor which serves to operate the shears is also used to move the whole arrangement to any part of the works where shearing operations are to be carried out.

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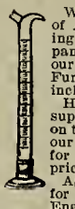

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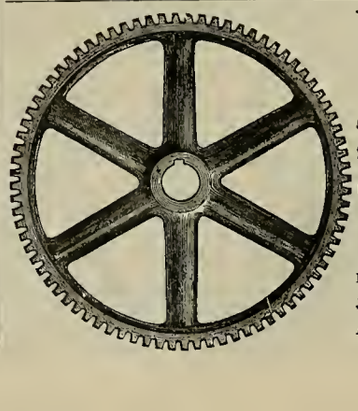

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Leakage of Steam Plants.

Waste of steam by leakage is a thing which may be expected in all steam plants, but it is too apt to obtain excessive proportions where it is believed to be trifling. Although attention has often been called to the matter, its importance cannot be too forcibly reiterated. Excellent engine performance way be secured by providing the required ecouomical type of construction, aud the highest economy in the generatiou of steam is obtainable by careful attention to the best principles of combustiou aud operation of boilers; but the consumptiou of coal is sure to he greater than it ought to be if some of the steam escapes from the plant by leakage, either from the boilers themselves, the piping or stop valves, or by passage through leaking valves and pistons in the engine cylinders. This very thing is one of the greatest objections to the use of high pressures, and it is in plants where high pressures are in vogue that the utmost vigilance should be exercised in this important matter. An instance may he referred to where leakage was going on to an excessive degree when it was least suspected. An excellent arrangement of steam piping was provided, says the *Engineering Record*, in which all the water of condensation found its way by gravity to one low point, where a separator was applied, the drain pipe of which led through a trap to an open exhaust steam heater. The steam trap, iufluenced by the action of the pressure, which iu this case was extremely high, failed to work efficiently, and it allowed a continuous eseape of steam unchecked, and, with the arrangement of discharge noted, undetected. The loss of steam at this one point was far in excess of any saving resulting from the high pressure which was carried, and vitiated the economy of a plant which would otherwise have been unexcelled.

It would well repay the eugine man in charge of a power plant if a thorough examination were made for leakage at regular intervals of say onec a month. It is an easy matter to determine the amount of leakage from the boilers and steam piping hy observing the fall of water in the gauge glasses when the engine is stopped, and the usual steam pressure maintained. If there is no loss the full height of water should he maintained continuously, or with practically no reduction. On the same occasion the valves and pistous of the engine should also he examined for leakage, which can easily he tried hy the indicator cock test, so far as this applies, and hy the time method when the other is unavailable. With systematic attention to these matters loss of steam hy leakage could not go unawares for a great length of time, and when found the proper remedy could he applied for its prevention.—Manufacturers' Gazette.

Hydraulic Forging.

Engineering - Mechanics says: The Brener-Schumacher process of hydraulic forging so fully developed in Germany has been introduced in England hy a Leeds concern, which has made a second press that does wonderful things. The press exerts a pressure of 700 tons, aud can make long and slow strokes or short and quick ones, as desired. A large steam cylinder is used instead of a pumping eugiue, the piston of which is prolonged and acts as a ram for exerting hydraulic pressure on the forging tools through the medium of a second hydraulic cylinder. *Engineering*, in speaking of the press, says: There are two steam cyliuders placed over the press to lift the forging crosshead, hy which the upper forging tool is carried. When it is desired to work in the ordinary way with heavy pressure, the admission and exhaust of steam in these lifting cyliuders is controlled by the same lever which regulates the admission and the exhausting of the steam in the large driving cylinder, but for quick working direct and uninterrupted communication is established by means of a separate cock between these lifting cylinders and the boiler. In this way there is then always the full boiler pressure beneath the cylinder, tending to keep the crosshead and upper tool at the top of the stroke, but the main steam cylinder, which puts on the forgiug pressure—through the hydraulic mechanism—is of so much greater area than the combined area of the two small cylinders, that the crosshead is pressed down with considerable force; although, of course, with less force than if the two lifting cylinders were exhausting in the usual way; in fact, the main cylinder has to work against a back pressure equivalent to the total steam pressure exerted on the area of the two lifting cylinders. It will thus be seeu that the two lifting cylinders are, in this method of working, always endeavoring to lift the crosshead, and immediately pressure is released from the main cylinder, they can do so. At the same time the pressure on the work is reduced, aud thus a very quick though somewhat lighter motion is obtained. As an example of the value of this feature it may be mentioned that a crank shaft can now be forged in one heat which would have formerly required three heats. The steel slabs nine inches by four inches are cut and sliced round and then drawn to twenty-four inches in length and three inches in diameter withiu six minutes of being placed on the anvil of the press. With regard to the forging of railway carriage buffers, the part to form the head is five and oue-half inches in diameter and six iuches long, to which is attached the two and three-quarters inch diameter shaft. The head is formed from the solid within two minutes from being taken out of the furnace to the time of leaving the forging dies. The heads as finished arc fourteen inches in diameter and five-eighths inch thick at the periphery, and, of course, thicker in the center.

Narrow-Gauge Roads Increasing.

Notwithstauding the great interest in narrow-gauge railroads in Europe about 1873, says the *Railroad Gazette*, few were huilt. Of late years, though there has been less talk, there has been more done. France is getting a considerable system of such roads, and Germany has huilt several. In the railroad statistics of the German Empire for the year 1892-93 there are reports from thirty-four such roads in operatiou, measuring in the aggregate 489 miles, which is three per cent of the whole railroad system. They had cost on the average $21,136 a mile. In Alsace-Loraiue, where they were cheapest, they had cost only $10,500 a mile; in Saxony, where they were dearest, $29,000. One line in Alsace cost but $4670 a mile, and onc Saxon mile, $43,000. The speed permitted on them varies from 5 to 18½ miles an hour. Their earnings are generally light, averaging $1920 a mile gross, but some have much larger earnings. The most profitable one is one of the costliest. On the average their net earnings were 2.19 per cent of their cost in 1892, and 2.3 in 1891. The sharpest curve is six feet radius on a spur to a hlast furnace. About one-third of the whole mileage is huilt on the highways. There is a station on the average to every 1¾ miles of track. One-seventh of all the railroads in Alsace are of narrow gauge, one-eighth in Saxony, and one-fourteenth in Baden; but only a very small proportion in the other German countries.

Cost Per Horse Power.

"Cost of an Indicated Horse Power" was the title of a paper read hy Decoursy May, of Niagara Falls, before the American Society of Mechaaical Engineers. Reliable data as to the cost of operating steam plants he found scarce, due partly to coucealment, but usually to ignorance. Reviewing a few estimates and papers which he found on the subjeet he reached the conclusion that one indicated horse power cannot be produeed for 365 days of 24 hours each for less than $40, with coal at $5 per ton of 2240 pounds. From such data as he was able to collect, allowing 5 per cent for interest on plant, 5 per cent for depreciation of plant, 1 per cent for insurance and 1½ per cent for taxes, making no allowance for rental or interest on the land occupied by the plant or cost of water, Mr. May presents a tabulated statement of the cost of running various types of power, both continuously and for only 10½ hours per day, with coal at various prices. For 308 days of 10½ hours each and with coal at $2 per ton of 2240 pounds, the cost of one indicated horse power is estimated by Mr. May as follows: Triple expansion pumping, Allis, 20 revolutions, $31; triple expansion, without pumps, Allis, 50 revolutions, $16; compound mill, best engine, $17; compound mill average, $22; compound electric light average, $78; compound trolley, $29; triple expansion trolley, $26; condensing mill, $25; non-condensing, 50 to 200-horse power, $49. With coal at $4 per ton the cost is increased from $4 to $12 per horse power.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

REOPENED.—Calaveras *Citizen:* The Basella mine has recently been reopened under the supervision of E. L. Burns.

We have been informed that operations have been begun upon the mine operated some time since by Colon Campbell of Oakland. Jos. Heinsdorf of Oakland is superintending the reopening.

Inyo.

SOUTHERN INYO MINES.—*Register:* From parties who have visited the mining locality south, we have the following summary:

Some fourteen miners are at work at Cerro Gordo, mostly on the old dumps. The total shipments foot up to something over five tons every day in the week. Owing to the low price in silver the margin for profits on this output in not at all large. Tom Boland is the principal operator.

At the soda works at Keeler new work is mostly suspended since the summer's crop has been gathered. At a rough guess there are some 3000 tons piled up. A very complete and obviously quite a costly calcining or refining furnace is being erected by Supt. Wrinkle, and it is expected to be ready for work in less than a month from the present time.

At Darwin nearly forty men are at work, the larger number in the Sorba or Lane mine. This mine "goes down," and is yielding handsomely, keeping one thirteen-ton team hauling constantly to Keeler.

The Defiance, under Capt. E. A. Reddy, is working but a small force. It is yielding finely but a large proportion of the ores are of a grade that will pay hut little at the present price of silver, so none but the high grade ores are being shipped. On the whole this property is doing very well.

At old Coso several men are working to reopen the gold ledges of that somewhat famous old camp, but with what result we are not informed. Joe Danielson, once of this locality, is one of the prospectors.

Low silver has nearly depopulated Panamint, where until recent months some thirty men or more made a good living, if nothing more, in chloriding.

NOTES FROM SOUTHERN INYO.—*Independent:* The Soda Company will furnace several hundred tons of soda as soon as a supply of wood can be obtained.

It is rumored that the force of miners at the Reddy mine at Darwin will be cut down, on the first of November, to a few men, probably three or four. The mining outlook continues favorable there.

Pat Clinton has secured a contract to sink the Newton shaft, at Cerro Gordo, one hundred feet deeper, and is having a carload of timbers hauled up the hill by Horace Elder's team of Lone Pine. Mr. Gus Stecker, of Independence, will do the carpenter work for Mr. Clinton.

Nevada.

WASHINGTON MINING MINES.—Nevada City *Herald:* John McCarthy has bonded the St. Patrick ledge to Henry Phillips, superintendent of the Mountain View mine, and development work will probably soon be commenced. This ledge lies directly across the river in front of town, and is on the contact of the serpentine and slate belts. Like the Giant King, which is on the same lead, it is an immense vein, being ninety-two feet in width. Mr. McCarthy has made three test crushings of the rock taken at random and reports a yield of $2.45, $2.50 and $5.30 respectively per ton. Though low grade ore it is estimated that at these figures it can be made to yield large returns, for the work of extracting and milling can be done at a very low cost.

D. P. Stewart and Captain D. S. Donohue, owners of the Maryland mine, on McCall ravine, three miles from Washington, are greatly elated over their fine prospect. A test crushing of thirteen and a half tons yielded $250. The lower tunnel is now in 300 feet and a crosscut made on the ledge. A raise has also been made to the surface from the upper tunnel.

Charles Phelps, owner of the Phelps Hill gravel mine, reports that he now has the main drift into the channel proper, and the nuggets taken out are such as reminds the '49er of "the good old days." Mr. Phelps is the owner of 320 acres of placer ground which, if worked by the hydraulic process, it is believed would prove to be another Alpha or Omega. The claim is thickly covered with some of the finest timber in the State.

W. W. Waggoner has lately made a survey of the Giant King ledge and tunnels. According to the survey the company will have to run about forty feet yet before they strike the foot wall of the ledge with the lower tunnel, which will make the entire distance 468 feet.

J. H. Smith has struck some fine placer ground on Gaston ridge. He has not developed the claim much yet, but the prospects obtained show that the early days miner did not get it all. Some beautiful specimens have been taken out, one piece weighing about $85, and several others exceeding an ounce in weight. The ground is shallow and can be easily worked by the sluicing process, but on account of the lack of water, at present Mr. Smith is working it by drifting.

Samuel J. Alderman is making a survey of the Gambrinus mine for John McBean & Co., and while here will also survey some timber land for Conrad Grissell of Nevada City.

MACHINERY STARTED.—Grass Valley *Union:* The machinery at the Independence mine has been started up and works very nicely, reflecting great credit on H. L. Body, who had charge of operations. The work is very compact and strong, the gallows frame being one of the most substantial in this district. It is built of fourteen-inch timber and is thirty-four feet high.

The hoisting for the present, while the shaft is being sunk, will be done by means of a bucket, but preparations have been made for a cage as soon as the shaft is down. The pump is ready to start but is not needed as yet.

Mariposa.

IMPROVEMENTS OF THE SIERRA BUTTE COMPANY.—Mariposa *Gazette:* Much activity prevails at Whitlocks where the Sierra-Butte company have their headquarters in this county. It was late in the season when they came in possession of this property, and it is a long distance to saw mills, but nothing has deterred them, and everything is being put into perfect order, which shows the permanency of their intentions. Lumber is being hauled to the plant as fast as it can be supplied at the mills; cottages for the workmen, a boarding house large enough to accomodate eighty workmen, and an office 44x25 feet are all under construction. The office is two stories high and will be nicely finished in surfaced lumber.

The plan of the mill which is to be built this winter shows a capacity for forty stamps, but at first only twenty 1000-pound stamps will be put in. The most improved concentrators will be used, in fact all of the machinery will be of the best kind it is possible to obtain. A Cornish pump and engine have been put in at the Alabama and this mine is being made ready for work, and by the beginning of winter both the Whitlock and Alabama will be ready to show what is in them. Just now one of the largest shafts ever sunk in this county is being sunk on the Whitlocks. It is a three compartment shaft, 16x6 feet, and will be a triumph of mining engineering when completed. With the exception of this shaft nothing else in the way of prospecting is being done just now. Repairing and timbering is called dead work, and that is what has to be done always before more extensive tunneling or sinking can be done. The lower tunnel has been enlarged under the new management, and sufficient work has been done to convince them that they have a mountain of good ore to uncover. A great deal of ore is now on the dumps, and by the time the mill is ready to run, many active miners will be at work underground and the busy Burleigh drills will be tearing out tons of good quartz.

The Sierra-Butte company show their faith in our section of the country by the investments they have made here and near us. In addition to what they have in this county, they have purchased an extensive mining property just over the border in Tuolumne county and have a forty stamp mill about completed, and are spending a great deal of money in improvements there just as they are doing in Mariposa. The gentlemen in charge here are all practical mining men perfectly conversant with all matters pertaining to their business, and we are all heartily glad to have such people indentified with our interests.

Plumas.

OF THE DEBRIS COMMISSION.—*National-Bulletin:* On Saturday, Lieut. Gillette, secretary of the California Debris Commission, reached Quincy, and, with A. W. Keddie, C. E., departed on a visit to the Northern Placer, Tefft, Squirrel Creek, Yankee Ravine and Mohawk placer mines, where restraining works have been constructed in pursuance of instructions from the Commissioners. The examination was made by Lieut. Gillette, and he departed for San Francisco on Monday via Reno, Nev.

Shasta.

COAL.—*Cause:* Extensive coal deposits have been discovered about twelve miles from Bartles, on the McCloud river, Cal., embracing ten square miles of territory. Several claims have been taken up. The coal is of good quality. Work will be commenced immediately toward developing the new find and will consist of several tunnels and shafts. A wagon road will be built from Bartles to the site at an early date, and if surface indications amount to anything, the coal deposits are something great. The coal is bituminous and burns very freely, having little or no shale in its composition.

Sierra.

SIERRA CITY.—*Mt. Messenger:* Times are still on the improve here, and most of the miners are working. Main street is crowded with freight wagons loaded with winter supplies for the stores and mines.

There are forty stamps running at the Bonanza ledge. The pay chute is thirty feet wide, and the owners claim there is sufficient ore available to last for twenty years or more. Geo. Black is amalgamator and one of the best. Geo. M. Pinney, who owns half of the property, is still here and intends remaining for some time. This is one of the most extensive and promising ledges in Sierra county, and will be thoroughly developed for all that it is worth.

Siskiyou.

GRAVEL.—Yreka *Journal:* The Spangler Brothers have worked up Humbug creek from its mouth to the old works, where the old drain has been opened, letting out the flood of water, which will require a few days to run off. They found excellent prospects along the bedrock before reaching the drain, and as soon as the bedrock water runs off, to permit digging and hoisting again, they will be able to take out rich paying gravel in great abundance.

W. Larison, engineer of the machinery at the Spangler mine on Humbug creek, is in town this week, waiting for the water to run out of the drain at the old works just tapped.

The river miners on the Klamath are now very busy hoisting pay gravel, and will continue to take out considerable gold dust until the winter storms of December set in. The Benz Bar claim, at Honolulu, is probably paying the best of any claim on the river. Good prospects have been discovered at the Beebe Bar mine, a short distance below the mouth of Humbug creek, with indications of good pay from now on, until winter storms interfere with operations.

NEVADA.

Washoe District.

SIERRA NEVADA.—Virginia *Enterprise:* During the week we have placed the car track and air pipes in the face of the intermediate tunnel and advanced the tunnel 14 feet; total length, 567 feet; face in porphyry with seepage of water.

The northwest drift, at a point 160 feet west from the mouth of the Layton tunnel, is out 164 feet; advanced 36 feet during the week; face in clay and quartz giving low assays.

S. N., M. & U. SHAFT.—The east crosscut from the north lateral drift, 450 feet north of the west drift, 1520 feet west of the shaft, 900 level, has been advanced during the week twenty-six feet; total length, 164 feet; face in quartz.

The west crosscut from the Union Con. south lateral drift from the west, 1520 feet west of the shaft, 900 level, has been extended twenty-four feet during the week; total length, 195 feet; face in clay and porphyry.

UNION SHAFT.—On the 900 level of this mine the east crosscut from the north lateral drift, 450 feet north of west drift, 1520 feet west of shaft, has been advanced during the week twenty-six feet; total length 164 feet; face in a mixture of quartz. The west crosscut from the Union Con. south lateral drift from west drift, 1520 feet west of shaft, has been extended twenty-four feet during the week; total length, 195 feet; face in clay and porphyry.

SAVAGE.—On the 1100 level in the north lateral drift, started from the east drift, they continue to extract ore from the sill floor upward to the seventh floor, and ore of fair grade is also being stoped from the south drift from the east drift on the same level. During the week we have hoisted fifty-seven cars of ore, the average sample of which assayed $29 per ton. On October 24th they resumed shipping ore to the Nevada mill and 225 tons were shipped during the week. The mill began crushing the ore on the 27th, but owing to interruptions caused by repairing the water company's flume only seventy-five tons were milled.

CHOLLAR.—On the 550 level our north drift from the main west crosscut has been cleaned and repaired for a distance of forty feet.

The winze from the 450 level, thirty feet south of the north line, is now down a distance of thirty-six feet; the bottom shows a width eleven feet of ore, face samples from which run from $25 to $55 per ton.

We have extracted from the winze and from the old stope on the 450 level during the past week 193 tons and 1,600 pounds of ore, the average battery samples of which was $39.11.

We have shipped to the Carson Mint 325 pounds of crude bullion.

POTOSI.—The winze from the 450 level, 200 feet south of the north line, is down forty-eight feet; the bottom is in porphyry with a streak of low-grade quartz showing pay.

The south drift from the main west crosscut, 550 level, has been extended to a total length of seventeen feet.

We have resumed work in the face of the northwest drift from the shaft on the surface, which is now out a total distance of forty-seven feet; face is in quartz of low grade on the average.

CROWN POINT.—The south lateral drift on the 500 level has been advanced for a length of forty-four feet south of crosscut No. 1. The face continues in porphyry, clay slips and quartz of no practical value. During the past week we have extracted from the stopes above the 600 level and from the openings between the 600 and 700 levels 616 tons and 220 pounds of ore, which has been shipped to the Mexican mill for reduction. The average battery sample for the week was $9.53 per ton, of which $8.68 per ton was gold.

BELCHER.—Seventy tons of fair-grade ore has been hoisted during the week.

Prospecting continues on the 300, 350, 400, 600, 1000 and 1100 levels.

Tuscarora District.

NAVAJO.—Tuscarora *Times-Review:* No. 2 crosscut on the 150-foot level has been extended six feet. Rock still hard in the face.

BELLE ISLE.—North drift on the east vein, 250-foot level, has been extended nine feet, showing no change. South intermediate drift, same vein and level, is in fifteen feet. The face is in low-grade ore. The stopes are looking fairly well and are yielding the usual quantity of ore.

Kennedy District.

CYANIDE PROCESS.—*New Era:* C. E. Kennedy, the discoverer of this camp, has been making practical tests, in ton lots, of the surface ores by the cyanide process. He saves ninety-five per cent of the gold and thirty per cent of the silver by using a three-quarter of one per cent solution and giving twenty-four to thirty-six hours' time.

The Shamrock Company are in ore in their long tunnel, and it is thought they are just

The Annual Convention

OF THE

California Miners' Association

WILL BE HELD IN

SAN FRANCISCO,

MONDAY.....November 19th, 1894.

Questions of importance to the Quartz, Drift and Hydraulic Mining Industry in California will be considered, and County Mining Associations are requested to appoint delegates at once.

Our Senators and Congressmen are expected to be present at this Convention and the Miners of the State will have an opportunity of bringing before them such matters as affect the welfare of the Mining Industry.

Place of meeting will be published later.

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entering the fourteen-foot vein which is exposed in their upper works. Tbis vein averaged $18.50 in gold, carrying uo silver.

Wiggins & Wilson have three wngons loaded with ore on the road to Winnemucca, which is the first of a fifty-ton shipment consigned to smelters at Snit Luke City. The ore is valued at $120 per ton in gold, and has been taken from the ledge without sorting.

The clean-up at the Imperial mill last Thursday gave the best results yet obtained, and the management is correspondingly elated.

When the Jenkins mill completes the reduction of Crown Point ore, the plant will receive Pride of the Mountain ore exclusively.

Dave O'Neal and partners are having 130 tons of Crown Point ore reduced at the Jenkins mill.

The new Imperinl north drift in No. 1 winze is in six feet of high-grnde ore, which would give a profit even to ship.

OREGON.

THE COLUMBIAN.—*Bedrock Democrat:* The Columbian mine, the property recently purchased by Chicago people from Messrs. Gorman and Reynolds and situated northeast of the Virtue mine, is proving to be a great property.

Mr. Toppy Johnson, the superintendent of the mine, brought in last Sunday samples of ore from the lower level which shows free gold profusely taken from a ledge fully eight feet in width. Mr. Johnson disposed of his one-third iuterest in the property a few days ago and now he is sorry for it. He says the mine will undoubtedly prove to be one of the greatest gold propertios in the northwest, and being in tho hands of a company with ample meaus to operate it will become a big producer in tbe near future.

HYDRAULIC MINES.—Rogue River *Courier:* Collis & Wickstrom started their hydraulic works in operation at the Dry Diggings Saturday.

Bailey and Miller have just finished setting up 1000 feet of hydraulic pipe on their placer on Missouri Flat, not far from the Mountain Lion mine.

Messrs. Spencer & Gunning have put about 2000 feet of hydraulic pipe in position to play ou their placers at Bloody Run this winter. The diggings are just back of Ole Severson's place and are known to be rich.

F. F. Johnson, formerly landlord of the Palace hotel, camo in from Oak Flat this week and reports the work of building a three-mile ditch progressing favorably. He and two other miners are interested in the project and have a good placer mine awaiting the water which comos from Soldier creek with a fall of 200 feet. The bank averages fifteen feet to the bedrock and prospects well from the grass roots down. The scene of operation is down the Illnois river twenty-five miles from Kerby and fifty from Grants Pass the road you have to travel.

SPARTA.—*Bedrock Democrat:* Mr. C. D. Reed shipped somo of the famous Dutchman ore from Paddy creek to Everett, Washington, last Thursday.

Mining men from all over the country are taking an interest in and around Sparta. More sales have been made this year than for twenty years past.

Messrs. Wood, of the Crystal Palace group, have twelve meu at work and intend to put on quite a force as soon as buildings are erected to accomodate them. Their foreman came from New Mexico to take charge.

Messrs. Clough, Wilson & Co. have running on Eagle creek the neatest arrastra in the State of Oregon, and have just completed a run that gave very fine results.

Par Long, on Lower Powder, has been steadily developing his property and now bas in sight a fine body of rich ore.

Several mining transfers took place last week, Mr. Chamberlain buying his partners out. They have done very well this season.

Messrs. Hook and Chas. Durkee are drifting on good ground and are putting in supplies for the winter.

Dr. Jay Guy Lewis is expecting the McGee machinery. The process of working is extremely simple and cheap and the good doctor says it will revolutionize mining hase ores.

Coast Industrial Notes.

—There are twenty-two teams engaged in hauling freight from Nevada City to the mountain towns above.

—The Nevada City trustees are going to huild an iron bridge across Deer creek to replace the wooden one which broke down the other day.

—The Reno *Journal* says that M. O'Brien, the mill furnisher of San Francisco, has gone to Carson and Douglas county, to see ahout building two flour mills in that part of Nevada.

—In England in 1886 there were 619,106 miners. In 1892 there were 963,000. The reason of the increaso is that many agricultural laborers, finding it difficult to get work in their line, have become coal miners.

—J. J. Holmes, of Hawthorne, has secured the contract for grading and laying nine miles of track for the Mohawk and Sierra Valley Railroad Company. The road connects with the Nevada and Oregon, and is designed to tap the sugar pine regions of Sierra county.

—The Sloan & Haskell mines at Susanville, Oregon, recently purchased hy an Eastern syndicate, are to he operated on a more extensive scale than ever the coming year. A large shipment of hydraulic pipe is en route from San Francisco and will arrive shortly.

—The *West Coast Trade* says that the Detroit Dry Dock Company has been investigating the opportunities for establishing ship yards on Puget Sound for some time, and E. L. McAllister is now there with the intention of locating an engineering office eitber at Tacoma or Seattle. If the investment pays, a compauy will be formed in the near future for the purpose of building vessels on an extensive scale.

—Messrs. Ellis & Cupid, of Nevada, bave bought the Rembol & Young gravel mine nt Sumpter, Oregou, and will develop it on a large scale. They have ordered from San Francisco 80,000 pounds of twelve-inch hydraulic pipe, and an electric dynamo for the lighting of mines for night work, and new machinery for the sawmill.

—A new market has been found for California hops, which are now quoted at a lower rate than ever before known in the history of the State. For the past three months every steamer that has sailed hence for the Orient has carried shipments for Calcutta. The steamer City of Peking, on her last trip, carried for the city on the banks of the Houghly 28,677 pounds, valued at $2700.

—The local coal trade for domestic uses is increasing daily, as the late storms have caused housekoepers to replenish their coal hins. Housewives who figure closely their cost of fuel cannot complain this year, as all grades of coal are lower than for yoars past, with every indication of no advanco this winter. Tbere have heen very liberal arrivals of foreign coal recently.

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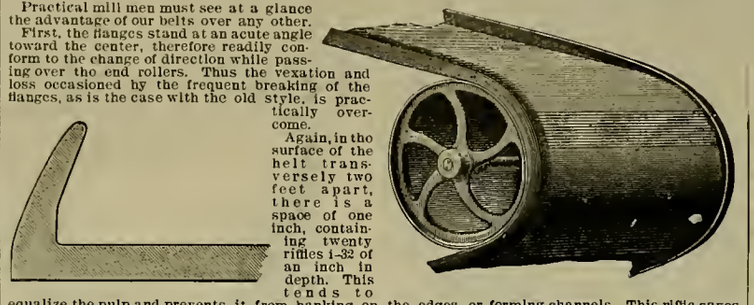

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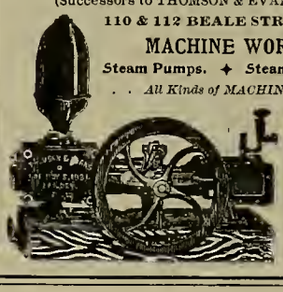

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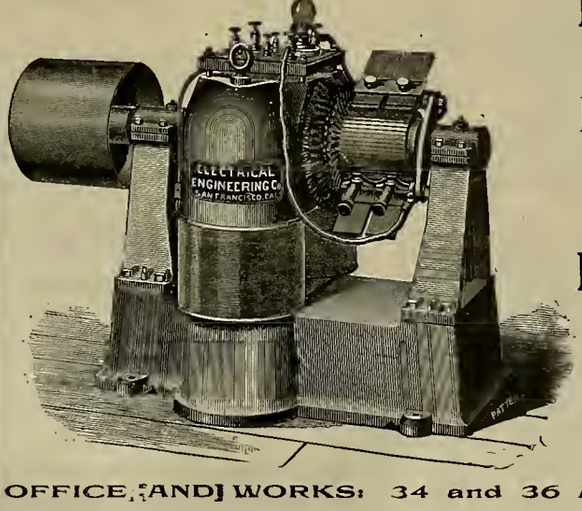

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Scientific Progress.

The Merits of Different Types of Ships.

Charles H. Cramp, in reply to a New York *Herald* correspondent relative to the report that a Chinese armored ship has been sunk by one or more unarmored Japanese cruisers and as to whether the fact is an argument against armored ships, said:

"I do not consider it any argument at all. In the first place we do not know what the facts are. The statements received thus far are too meager to base even a surmise on. Probably all the facts and all the conditions will never be known. Certainly they will never be known as accurately or as analytically as if the engagement had been between European fleets. The discussion you speak of cannot be intelligent in the absence of information. I think you will find some men who have fads are trying to make out a case in their favor—that is all. You may expect that always. For example, when the Blanco Encalada was sunk by a torpedo during the Chilian revolution every torpedo boat enthusiast declared that the death knell of battle ships had been sounded. When all the facts came out, it appeared that the Encalada was perfectly helpless, being moored and having her machinery disconnected, with some parts of it on shore for repairs. She was, therefore, simply a target. To sink her with a torpedo under such circumstances was not much more of a warlike feat than blowing up a derelict. Now, on the strength of meager and conflicting reports that a Chinese armor-clad has been sunk by a Japanese cruiser, another fad gets an airing. But whether we ever get accurate information or not about the details of this affair, it is safe to assume that the fact of any ship being sunk in this Oriental war will not conclude anything as to the merits or faults of the type. Both the Chinese and Japanese, though they have made great progress, considering their opportunities for practice, in naval manœuvres, are still far behind the Western nations. This is particularly true with respect to the more recent ships, with their complex construction and intricate machinery. The Chinese make good sailors, and with sufficient practice and training would develop capable officers. But they have not had any modern ships with which to train and practice until recently. The entire system of modern naval warfare, both mechanical and tactical, is new to them. In fact it is new to everybody in the practical sense. Admiral Sir George Tyron was considered the ablest man in the British navy. At any time before the loss of the Victoria it would have been considered in England almost heresy to doubt his mastery of seamanship. Yet he committed the greatest and most fatal blunder in the history of naval manœuvres. Now, when such things are possible with the ablest officer in the British navy—at least such by prior reputation—what must we not expect from Chinese, who, perhaps, never saw the inside of a steam battle ship until a few years ago? The man is everything in modern naval warfare. The ship becomes, with each stride of improvement, more and more a machine, a tool. This is as true of this country and Europe as it is of the Chinese and Japanese. The man must have a ship, and, of course, the better and more powerful the ship the greater the execution that the competent man can do with it; but to jump at conclusions as to the merits of different types of ships, or to rush into print, as some so-called 'experts' are doing, with alleged 'professional opinions' on the basis of the fragmentary and contradictory information that we now have is rankly absurd and should be exposed to ridicule and derision. For these reasons, I say that the naval events of this Asiatic war can prove nothing as to the relative value of types of vessels."

Sunlight as a Disinfectant.

Two important series of experiments have been in progress for some time upon the action of sunlight as a disinfectant. Professor Marshall Ward has demonstrated the bactericidal action of light, and this subject has also been dealt with from a scientific aspect by Percy Frankland. Professor Buchner has endeavored to carry these facts into practical account, and has found that in water typhoid and other cultures have been completely destroyed by bright sunlight in three hours. Diffused daylight has had the effect of rapidly reducing them, although if placed in darkness thereafter a rapid increase was noted. To determine the depth at which this action ceases, partially exposed cultures of different germs were sunk in Stamberger lake, near Munich. At three yards below the surface the retarding effect was just perceptible, although it is known that light penetrates water to depths as great as 185 yards. It is apparent, therefore, that the effect of sunlight in the purification of rivers has been overestimated, and that it is confined to the surface. The action is really due not to bactericidal influence, but rather to the life-struggle between pathogenic and non-pathogenic organisms and the survival of the latter, together with a breaking up of those forms of life prejudicial to the continuance of human life upon this planet. Professor Esmarch has also used sunlight as a disinfectant for fibrous wearing materials, and has found that the heat liberated by the absorption of light waves upon a dark surface must be taken account of. His experiments demonstrated surface action of light and little more. At the same time a carbolic-acid two-per-cent spray proved but little more efficacious in checking the development of germs in the deeper parts of such materials or beneath the surface of skins, or in fur, where the bacillus of diphtheria was present.—Industries and Iron.

Foreign Work and Schemes.

Where cotton goods are woven it is customary to put the warp threads through a machine known as the "slasher" to stiffen them with size, so that they will be less liable to become tangled in the loom. Hitherto the size has been hot when applied. A machine invented by Johann Maag, of Winterthur, Switzerland, uses the preparation cold, but first subjects the threads to a current of moist air to render them more open to the reception of the size.

Ventilation will be effected in the great hall of the new Sorbonne in Paris by keeping the walls at a higher temperature than the rest of the room, and thus developing ascending currents of air along their surfaces. Air heated to a temperature of 200° is brought to a conduit behind the molding along the floor, and the walls themselves, it is expected, will thus be heated to 100°. Some of this warm air will be forced into the auditorium through small holes covered with netting.

At a recent meeting of the Paris Academy of Medicine, Dr. Hallopeau read a paper affirming that moderate exercise on a bicycle does not interfere with the action of the heart, except where there is some aortic or valvular affection. On the contrary, it is highly useful in promoting the action of the skin and lungs, developing the muscles, augmenting the appetite, facilitating digestion and stimulating general nutrition.

The use of cordite in small arms in the British service has been found dreadfully destructive of the grooves inside of the barrels. Experts declare that after five years' service a rifle is thus converted into a smooth-bore.

In a pneumatic bridge used on the Weser last summer a sort of harrow loosened the earth on the river bottom, and a jet of compressed air stirred it up and set it floating down stream with the current. The same system has also been tried with success in the harbor of Algiers, and at the Tidbury docks, London.

Enough of the new Siberian railway to reach Omsk, which is 4400 miles from St. Petersburg, has been completed. While construction was going on across an extensive bog, 4000 masks were provided for the men, besides burning juniper to create a smudge, as a protection against mosquitoes.

Inoculation for diphtheria with serum, derived from the culture of germs in modifying media, has been tried lately in France as well as other countries, and has been found a great protection against the malady itself.

A rough diamond from South America has been brought to the United States which is shaped exactly as if cut, which suggests the theory whether man has unconsciously been imitating nature, or nature imitating man's work. George F. Kunz, Tiffany's specialist in gems, declares that this specimen shows no evidence of being tampered with.

An Englishman has devised a scheme for leading obnoxious fumes from sewers up into the gas-lamps of the street and there burning them. Not only is health thus guarded against a dangerous poison, but the luminosity of the gas-flame is increased.

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Practical Information.

Difference Between Brussels and Tapestry.

By placing the two side by side, a clearness and sharpness is noticed about the Brussels pattern which is absent from the tapestry. In the latter there is a mistiness about the colors, and the pattern lacks that sharpness and delicacy which characterizes the former. This is due to the process of manufacture. A Brussels is a yarn-dyed and a tapestry may be described as a printed fabric, but the printing is done upon the yarn, before the process of weaving. The whole method of manufacture is most ingenious. In the making of a five-frame Brussels no fewer than 1280 ends of face yarns are required for the weaving of one piece of standard quality—each frame consisting of 256 bobbins, and 256 ends only can come to the face at each pick of the pattern. Therefore, 1024 ends of yarn are hidden in the body of the fabric. There are many qualities of tapestry, but in the production of the standard quality only 216 ends of face yarn are required, instead of 1280, which shows at once that the Brussels carpet has the great advantage of being thicker, softer, and altogether a more durable cloth, apart from other advantages which it possesses. There is a limitation in the number of colors used in a Brussels. In tapestry there is no limit. In the Brussels, the whole of the colors used show a more or less striped appearance at the back of the fabric; in a tapestry they do not show at the back at all. This fact is made use of by householders in purchasing carpets, this being about the only way the average person can tell the difference between them. In order to pass off tapestry as Brussels, some ingenious makers have resorted to the striping in a regular manner of the backs of the former. The stripey effect in the latter is broken and irregular. A casual observation of the clearly-defined character of a Brussels pattern should enable a buyer to distinguish between the two fabrics.—Manufacturers' Gazette.

How to Select Rope.

A German paper, in an article on the methods of rope manufacture from hemp, and the determination of the different qualities and the probable strength from the appearance, lays down the following rules: A good hemp rope is hard but pliant, yellowish and greenish gray in color, with a certain silver or pearly luster. A dark or blackish color indicates that the hemp has suffered from fermentation in the process of curing, and brown spots show that the rope was spun while the fibers were damp, and is consequently weak and soft in those places. Again, sometimes rope is made with inferior hemp on the inside, covered with yarns of good material—a fraud, however, which may be detected by dissecting a portion of the rope, or in practical hands by its behavior in use; other inferior ropes are made with short fibers, or with strands of unequal strength or unevenly spun—the rope in the first case appearing woolly, on account of the number of ends of fiber projecting, and in the latter case the irregularity of manufacture is evident on inspection by any good judge.

Manganese Steel.

Ordinary manganese steel, containing thirteen per cent of manganese, is not magnetic, but is made so by annealing at a high temperature. M. Le Chatelier has found that the transformation is effected in one or two hours at about 550° C. By heating the magnetic metal to about 800° and rapidly cooling, it is changed back into the non-magnetic variety. The steel is the more malleable the more energetically it has been tempered. At ordinary temperatures the electric resistance of the magnetic steel is much less than that of the other, which is the highest of any of the alloys of iron, but at about 740° the resistance of the two is the same. This is also the temperature at which ordinary iron loses its magnetic properties, and M. Le Chatelier therefore concludes that the alloy consists of a mechanical mixture of ordinary iron with a definite compound of iron and manganese.

Superheated Steam.

Between 1860 and 1870 superheated steam was very extensively adopted, especially for marine engines. After 1870 its use was soon discontinued. The reasons for this, writes Prof. W. C. Unwin in *Cassier's Magazine*, were probably these: (1) As the steam pressures used were increased, the range of superheating possible within the limit of danger to the lubricant was decreased, and the advantage of superheating correspondingly diminished. (2) The large superheaters in the uptake proved, in some cases, to be dangerous and liable to become overheated. (3) As the designing of steam machinery became more a matter of routine, and competition reduced the profits of engine building, the construction of engines fell into the hands of engineers who understood the action of the steam less well than the engineers who introduced superheating in 1859-60, and who regarded superheaters as unnecessary complications which it was convenient to abandon.

Diamond Saws.

Diamond saws for laboratory purposes could be made by taking discs of ordinary sheet tin six inches in diameter fitted on a lathe axle. Two circular pieces of wood are prepared five and a half inches in diameter. Between these the tin disc is set, and the whole is clamped to a vice. The edge of the tin disc is then notched by a knife in a direction slanting to the plane of the disc, the notches being as close together as possible and about a tenth of an inch in depth. The grooves so formed are filled with a mixture of finely powdered diamond dust mixed with some oil to form a stiff paste, and the teeth of the notches are then flattened, holding the diamond powder rigidly. Such a saw can do valuable work in a laboratory where crystalline rocks have to be sliced, and may be conveniently driven by a small electromotor.

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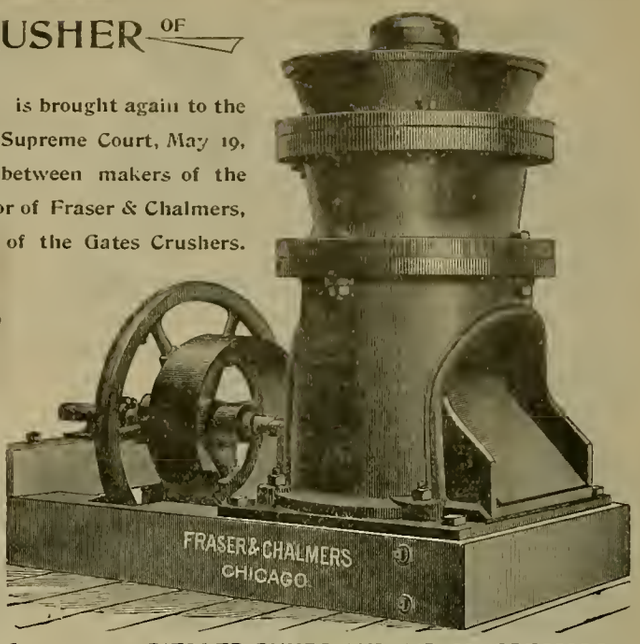

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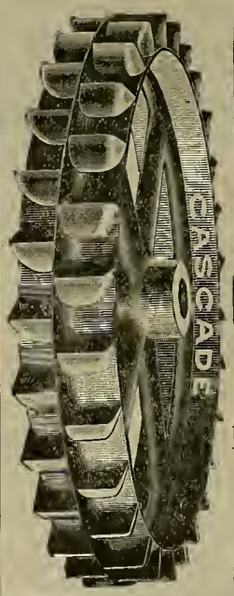

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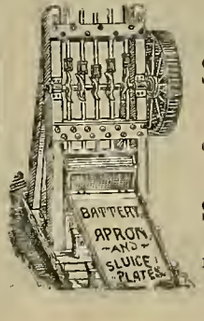

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Market Reports.

The Markets.

SAN FRANCISCO, Nov. 8, 1894.

Local dealers prophesy an immediate advance in the price of quicksilver. Rail shipments overland for the first nine months of '94 aggregated 7511 flasks, worth $248,051. The shipments for the corresponding period in '93 were 9344 flasks, worth $384,896. The receipts here for October were 1680 flasks. During last month the sea shipments from here were 1419 flasks, worth $43,962. Of this, 1000 flasks went to New York and 317 to Mexico. From Jan. 1st to Nov. 1st there were shipped 12,655 flasks, worth $383,161.

Silver has varied but little during the week. The London *Financial News* says that "quite a dead set is being made at the once universally acceptable Mexican dollar. The British dollar now in course of preparation will shut it out of the Straits and Hong Kong. Santo Domingo has demonetized it, and now Spain is going to send over 10,000,000 pesetas in Spanish piasters to Porto Rico as a substitute for the Mexican dollars, which form the main portion of the currency of the island. The Bank of Spain is to provide the coin to effect tbis exchange, the reason for which is not very apparent."

The finance committee of the Spanish Cortes has decided to establish a gold standard of currency for Porto Rico. The Mexican dollar will hereafter be used only as a basis of weight for the value of silver.

The unusual character of the transfers of gold between March and October of this year, owing to the great demands for export, has led the Treasury Department to prepare a statement showing the amounts of such shipments during the period in question. According to the statement the following transfers were made: To New York—From Washington, $12,000,000; from Baltimore, $4,500,000; from Philadelphia, $3,600,000; from Boston, $500,000; from Cincinnati, $11,500,000; from Chicago, $5,000,000; from St. Louis, $5,500,000; from New Orleans, $2,000,000; from San Francisco, $7,500,000; from the Philadelphia mint, $69,960,000; from the Denver mint, $950,000; from tbe San Francisco mint, $7,500,000; from the Carson City mint, $2,000,000. From the Philadelpbia mint.—To Washington, $3,000; to Philadelphia, $4,100,000; to Boston, $5,900,000; to Chicago, $500,000. From the San Francisco mint to St. Louis, $1,000,000. From the New Orleans mint to New Orleans, $1,100,000. From New York to Boston, $250,000. These figures show a total of $145,663,000; transferred at a cost of $91,624. In addition, there was shipped from banks to Treasury offices $1,644,500; costing $1,856; making a grand total of transfers of gold of $147,307,500; at a total cost of $93,480.

This gold is going out of the country at the time when it generally comes in. In October, '93, the excess of gold imports was $1,072,919; in the same month of 1892 it was $2,634,080; in 1891 it was $16,088,352; and in 1890 it was $2,196,403. The excess is largely on the other side this year.

Reports to the Director of the Mint show that coinage for October was: Gold, $2,911,800; silver, $1,217,000, of which $600,000 was standard dollars; minor coin, $23,900; total coinage, $4,152,700.

The amounts and descriptions of specie shipped from here for the first ten months of '94 are as follows:

Silver bars	$5,857,376
Mexican dollars	4,559,130
S. Amer. dollars	150,872
Gold coin	12,301,507
Silver coin	592,140
Gold dust	1,661
Currency and bonds	1,447,287
Total	$24,909,973

New York Prices.

NEW YORK, Nov. 8.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.	Tin.
Thursday	29⅛	63⅝	....	....	....
Friday	29⅛	63¾	9 50	3 10	14 60
Saturday	29¼	63¾	9 80	3 12½	....
Monday	29 5-16	63¾	....	....	....
Tuesday	29¼	63¾	9 50	3 10	14 70
Wednesday	29 3-16	63½	....	....	....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	10c
New York Telegraphic Transfer	12½c
London Bankers' 60 days	$4.87½
London Merchants	$4.85½
London Sight Bankers	$4.88½
Refined Silver, per ounce	63½
Mexican Dollars, nominal	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6⅝
Powdered, "	—	@	6¾
Concentrated, "	—	@	6¼
COPPER.			
Bolt	21	@	—
Sheathing	22	@	—
Ingot, jobbing	—	@	19
Ingot, wholesale	14	@	15
IRON.			
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 45
Drop, B and *larger* sizes, " "			1 65
Buck, Balls and Chilled, do, " "			1 75
QUICKSILVER.			
Home trade, per flask	37 00	@	— —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delinq't and Sale.	Secretary.
Alpha Con, Nev	13....	10c....	Oct 30,	Dec 3, Dec 21	C E Elliot, 309 Montgomery
Challenge Con, Nev	17....	5c....	Oct 31,	Dec 4, Dec 27	C L McCoy, Mills Building
Ideal Placer M. W & P Co, Cal.	1....	10c....	Sept 11,	Oct 22, Nov 12	E L Mayer, Mills Building
Justice M Co, Nev	57....	5c....	Nov 2,	Dec 6, Dec 27	R E Kelly, 309 Montgomery
Navajo M Co, Nev	27....	10c....	Oct 3,	Nov 8, Dec 3	J W Pew, 310 Pine
North Banner Con T Co, Nev	32....	3c....	Oct 6,	Nov 6, Nov 27	C E Green, Fourth and Townsend
Occidental Con, Nev	17....	5c....	Nov 1,	Dec 4, Dec 27	A K Durbrow, 309 Montgomery
Quincy M & W Co, Cal	1....	25c....	Oct 31,	Dec 11, Jan 4	W C Ralston, Mills Building
Scorpion M Co	6....	5c....	Oct 4,	Nov 9, Nov 30	Geo R Spinney, 310 Pine
Silver King M Co, Ariz	12....	30c....	Sept 4,	Oct 15, Nov 12	J W Pew, 310 Pine
Starlight M Co, Nevada	3....	10c....	Oct 10,	Nov 19, Dec 10	H R Williar, 321 Pine
Utah Con M Co, Nev	20....	5c....	Sept 28,	Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3....	....	Sept 27,	.... Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Occidental Con	A K Durbrow, 309 Montgomery	Nov 19

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 7 50
Greta	7 50
Nanaimo	6 25
Gilman	5 75
Seattle	6 00
Coos Bay	5 50
Cannel	8 00
Egg, hard	12 00
Wallsend	7 00
Scotch Splint	8 00
Brymbo	7 50
West Hartley	7 75

TO ARRIVE—PER TON.

Australian	6 00	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	9 00	@	— —
Egg, hard	10 00	@	— —
West Hartley	5 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, Nov. 8, 1894.

The miniug share market has been affected by the election excitement, the same as other branches of business. Transactions have been rather light and fluctuations insignificant. On Tuesday no session of the Board was held. The average car assay of the ore from the new ore body in the Cons. California and Virginia mine is $67.70. The company will have sufficient surplus on band after paying all bills for last month to pay four dividends, of 25 cents per share each, nnd by the time tbe first dividend is paid the connection between the winze and the C. and C. shaft on the 1750-foot level will be made and the output of the mine will be increased. The mine produced $125,623.55 in bullion during the fifteen days' run of the Morgan mill from October 15th to October 31st, of which product $76,357.79 was gold. The ore was worked up to an unusually high percentage of its battery assny value.

The following mining companies report having had cash an hand October 31, 1894: Alta, $5057.43; Alpha Con., $2963.13; Andes, $12,061.36; Belcher, $15,387.82; Bodie Con., $67,524.35; Bulwer Con., $3457.59; Best & Belcher, $5701.63; Crown Point, $1326.45; Consolidated California & Virginia, $171,086.20 in cash, and unsold bullion valued at $17,086.95, with further large shipments to be received to close the monthly account; Church, $14,614.72; Chollar, $12,722.35; Con. New York, $2518.22; Challenge Con., $351.97; Con. Imperial, $1810.93; Exchequer, $3714.76; Gould & Curry, $10,213.16; Gray Eagle, $14.08; Hale & Norcross, $10,684.91; Lady Wasbington, $129.04; Mexican, $8542.84; Mono, $959.42; Ophir, $15,205.61; Occidental Con., $408.56; Potosi, $14,470.64; Savage, $3109.36; Silver Hill, $1213.32; Sierra Nevada, $15,842.63; Seg. Belcher, $5250.06; Union Con., $6505.10; Utah Con., $1741.61.

The Bodie Consolidated will pay a dividend of $25,000 on the 26th. Tbe Centennial Eureka of Utah paid a dividend of $30,000 at the close of last month. The Harqua Hala Gold Mining Company Limited of Arizona paid a dividend of 6d per share in London on the 30th. The Mercur Gold Mining and Milling Company of Utah paid a dividend of 12½c per share, or $25,000, last month at Salt Lake City. The Alaska-Mexican dividend of 15c per share, or $30,000, will be paid on Monday. This is the first dividend by that mine, and serves to give an additional point of interest to mining on Douglas Island.

Assessments delinquent this month aggregate $37,800. Of this amount $30,800 is for Nevada mines, $6000 for Californian and $1000 for a Mexican mine.

The following illustrates the changes of the week:

Mines.	1	8
Alpha	$ 6	.....
Alta Consolidated	20	.....
Andes	59	$ 62
Belcher	85	83
Best & Belcher	1 15	.....
Bodie	1 20	90
Bullion	35	34
Challenge	83	.....
Chollar	72	71
Confidence	1 05	1 05
Consolidated California and Virginia	4 85	4 60
Consolidated New York	3	.....
Crown Point	60	60
Exchequer	06	.....
Gould & Curry	65	.....
Hale & Norcross	85	1 00
Justice	24	18
Mexican	1 20	1 30
Ophir	3 05	3 30
Overman	18	19
Potosi	65	.....
Savage	69	58
Sierra Nevada	89	88
Union	65	.....
Utah	.....	10
Yellow Jacket	71	69

BACK numbers and files of the MINING AND SCIENTIFIC PRESS wanted. Address ALBERT TUTHILL, 1304 Franklin St., Oakland, Cal.

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 8, 1894.

9:30 A. M. SESSIONS.

200 Andes	61	200 Hale & Norcross	97
500	62	700 Kentuck	05
100 Belcher	80	300 Mexican	1 30
250 Bodie	88	100	1 25
300 Bullion	32	200 Ophir	3 20
200 Bulwer	10	200 Savage	55
200 Chollar	70	200 Sierra Nevada	85
100 Con Cal & Va	4 45	100 S Hill	04
20	4 50	200 Utah	10
100 Crown Point	54	150 Yellow Jacket	65

SECOND SESSION—2: 30 P. M.

50 Andes	62	450 Hale & Norcross	1 00
100 Belcher	82	300 Justice	18
250	83	550 Ophir	3 30
400 Bodie	90	200	3 25
300 Bullion	34	100 Overman	19
300 C. C. & Va	4 55	650 Savage	58
250	4 60	100 Sierra Nevada	86
300 Chollar	70	400	87
100	71	100	88
500 Con. Imperial	02	100 Utah	10
200 Confidence	1 05	50 Yellow Jacket	67
600 Crown Point	59	100	69
300	60		

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SEPARATOR.—Robert W. Jessup, Los Angeles, assignor of one-half to Fairfax H. Wheelan of Santa Barbara, Cal. No. 528,434. Dated Oct. 30, 1894. Tbis separator is principally intended for the removal of chent and oats from wheat and barley, and also to raise tbe grade of barley by separating the small sboe-peg barley from the larger grains. The device consists of non-moving, downwardly converging opposing walls mounted at an inclination in the direction of their length and forming a continuous discharge opening between their lower portions. One wall extends beyond the lower edge of the other nnd has its edge turned backwardly at an angle, and said projecting wall is adapted to be adjusted toward and from the opposing wall, and also to be adjusted vertically to vary the width of tbe discharge opening. One of the walls is flexible or yielding while the other is immovable.

VENTILATOR CARS.—Harry H. Love, Sacramento, Cal. No. 528,231. Dated Oct. 30, 1894. The object of this invention is to provide a means for ventilating cars, such as are employed for transporting fruit or other perishable products, and is equally applicable to smoking, sleeping and other passenger cars. It consists of a car having a double bottom, a passage or passages tbrough which air is admitted from the exterior into the channels or spaces formed between the two bottoms, openings whereby air is admitted from tbese channels into the interior of the car, a double roof baving corresponding longitudinal channels extending through and open at opposite ends, said passages having hinged covers at the ends adapted to be raised so as to produce funnel-shaped mouths in the direction toward which the car is moving, whereby a current of air is driven through tbese passages, and openings through the ceilings and inner roof with gauze-protecting covers tbrough which a circulation of air is established through the interior of the car. In addition to this, the sides and ends are also made double, with longitudinal and transverse passages respectively, so that there will always be a circulation of air entirely around as well as through the car.

CONCENTRATOR.—John Norbom, San Francisco, Cal. No. 528,442. Dated Oct. 30, 1894. This invention relates to certain improvements in traveling belt concentrators. It consists of an endless traveling belt moving over drums at the opposite ends of a framework, elastic arms curving in opposite directions, serving as supports for the framework, and means for oscillating the arms so that the framework and belt are moved transversely to their line of travel. These arms are peculiarly curved and attached, so that, in addition to the side movement, a peculiar tilting movement is also given to the traveling table. In conjunction with this is a device for supplying water to a distributing pipe which is supported upon the belt frame and partakes of its oscillating motion. By means of a worm gear and suitable intermediate mechanism power is transmitted from a shaft turning in stationary journals to the movable oscillating parts, so as to transmit motion to the belt. The belt is peculiarly constructed, with tubular flanges upon its edges to prevent the escape of the material over these edges.

LACE, VEILING OR RIBBON HOLDER.—Julius M. Soblesinger, San Francisco, Cal. No. 528,447. Dated Oct. 30, 1894. This invention relates to a holder for the exhibition of lace, veiling or ribbons, and in a construction of bases or supports by which the goods may be properly exbibited. It consists of a flat plate, tubular posts stamped from sheet metal having funnel-shaped ends, plates projecting from the sides formed in a single piece, witb the posts adapted to receive the ends of the bolder plate, a central socket piece passing tbrough one of the posts at right augles extending centrally into the holder plate, and a corresponding socket with polygonal opening adapted to fit a revoluble spindle with correspondingly shaped end whereby the holder may be rotated to wind the material upon it. In conjunction with tbis, I employ sprigactuated locking pins for holding the spindles in proper position.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from E. P. Hagar & Samuel Peeck in the E. S. Grant Mine, near Blue Tent, Nevada Co., Cal., to impound tailings behind brush dam in ravine below the mine; from John Black in the Spanish John Mine, near Rough & Ready, Nevada Co., Cal., to impound tailings behind brush dams in blind ravines and pit; from the Good Hope Mining Co., in the Richmond Hill Mine, near La Porte, Plumas Co., Cal., to impound tailings behind log and crib dam in Onion Valley Creek; from Leonard Dormody in the Martelle Mine, near Salmon Falls, El Dorado Co., Cal., to impound tailings behind dams in Martelle Creek; from J. M. Read & N. E. Beckwith in the Pine Grove and Hidden Treasure Mines, near Pine Grove, Amador Co., Cal., to impound tailings behind brush dams in Saw Mill Gulch and behind log and rock dam in Grass Valley Creek; and from the Gold Run Ditch & Mining Co., in the Gold Run Mine, near Dutch Flat, Placer Co., Cal., to impound tailings behind a rock filled dry masonry dam, 100 feet high, in the North Fork of the American River, about 2 miles above its junction with the Middle Fork, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Nov. 26, 1894, at 1:30 P. M.

Notice of Assessment.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1894, an assessment, No. 1, of 5 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 56, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of December, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Directors.

J. STADTFELD, JR., Secretary.

Office, 309 Montgomery St., Room 56, San Francisco, California.

NOTICE OF ASSESSMENT.—OCCIDENTAL CONsolidated Mining Company; location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey Co., Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of November, 1894, an assessment, No. 17, of five cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth day of December, 1894, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the cost of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

ANNUAL MEETING.—THE REGULAR ANNUAL meeting of the stockholders of the Occidental Consolidated Mining Company will be held at the office of the company, room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on Monday, the 19th day of November, 1894, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, November 16, 1894, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.

A MINING ENGINEER

Of a large western mining company, with extensive experience in working quartz and placer mines, desires a situation as manager or superintendent in California. Address J. T. C., care of MINING AND SCIENTIFIC PRESS.

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Cable Address: "RISDON'S" San Francisco.

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Johnston's Concentrator, Bryan Mills,

Challenge Ore Feeders, Air Compressors,

MINING, MILLING, PUMPING and HOISTING PLANTS.

The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager.

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

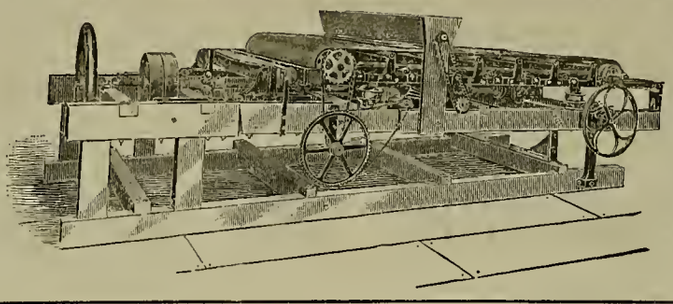
NINETY-FOUR AND ONE-HALF PER CENT —SAVED— ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness, combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, Igo, Shasta Co., Cal., May 25th, 1893.
THE McGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

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521 and 523 Market Street, San Francisco,

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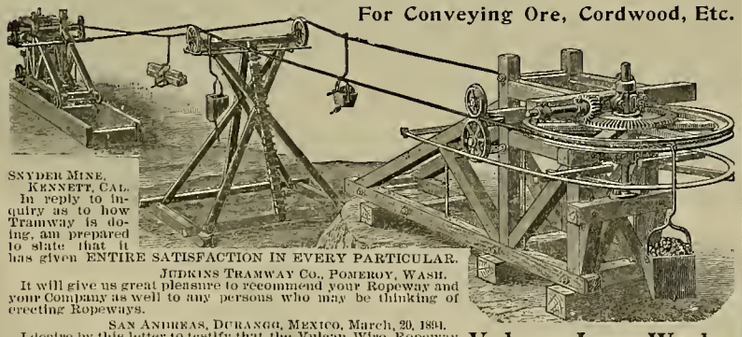
BATTERY SCREENS AND WIRE CLOTH.

—AGENT FOR—

Hoskins' Hydro-Carbon Assay Furnaces.

Stamp Mills!

VULCAN WIRE ROPEWAY
For Conveying Ore, Cordwood, Etc.



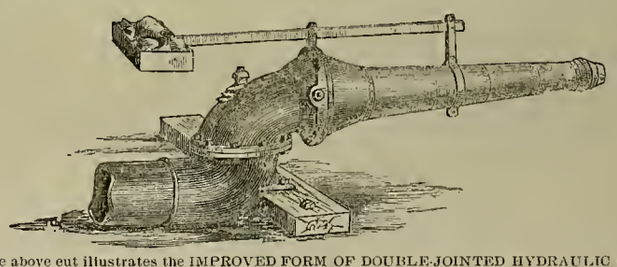
SNYDER MINE, KENNETT, CAL.
In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.
JUDKINS TRAMWAY CO., POMEROY, WASH.

It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.
SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.
ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

Vulcan Iron Works,
135-145 Fremont St., San Francisco.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 51 Fremont St., San Francisco.

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—MANUFACTURERS OF—

SHEET IRON & STEEL PIPE
FOR TOWN WATER WORKS.

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.
130 BEALE STREET, SAN FRANCISCO, CAL.

Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.

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Adamantine Shoes and Dies
—AND—
CHROME CAST STEEL
Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

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Special attention given to the purchase of Mine and Mill Supplies.

Stamp Cam.

INVENTORS, Take Notice!

L. PETERSON, MODEL MAKER,

226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential*.

FOR SALE.

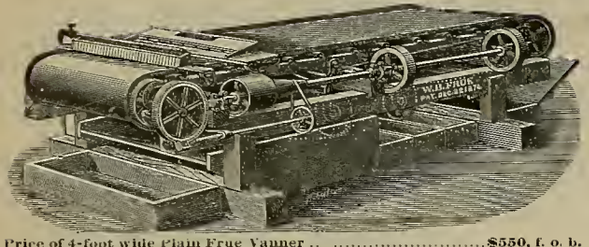
Two Mines of Free Milling Gold Ore.

For particulars address JAMES A. SCOTT, Reno, Nevada.

FRUE ORE CONCENTRATOR.

OVER 4000 IN ACTUAL USE.

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.



Price of 4-foot wide Plain Frue Vanner .. .. $550, f. o. b.
" " " Improved Belt Frue Vanner..... 700, f. o. b.
" 6-foot " Plain Belt Frue Vanner..... 700, f. o. b.

—o—

For any information, pamphlets, circulars or testimonials, call on or address

Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.

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C. J. Clark, M. E., Gen'l Supt. Dec. 12, 1891.

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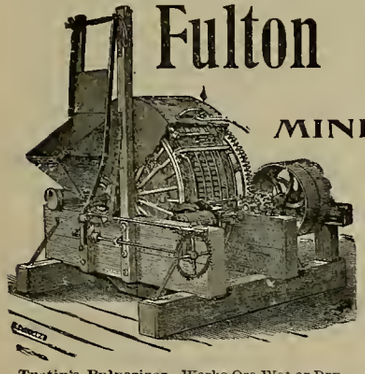

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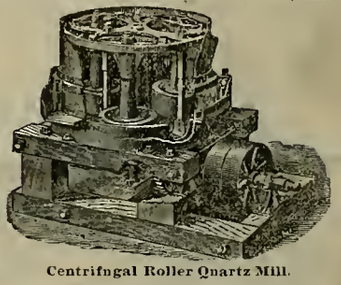

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX.
Number 20.

SAN FRANCISCO, SATURDAY, NOVEMBER 17, 1894.

THREE DOLLARS PER ANNUM.
Single Copies, Ten Cents.

STRIPPING A LEDGE OR VEIN AND STARTING TO SINK A SHAFT.

How It Looks.

"How does it look?" is a question often asked of a vein or ledge. The accompanying illustration, "taken from life," tells better than columns of description. It is not an ideal sketch, but a picture of the ledge stripped, and the start at sinking a shaft. There are, in this instance, no "dips, spurs, angles or sinuosities," but a very good idea of how a gold-bearing quartz ledge looks can be had from the most casual glauce at the cut. The dip is being ascertained by a clinometer in the hands of a man whose countenance will be recognized by a good many mining men.

To those unacquainted with ledges or veins it may be necessary to say that all ledges are not as square, wide, solid or well defined as the one herewith portrayed. In this regard the ledge outlined is a little better than the ordinary. Ledges vary greatly, from the "razor blade" ledges in the old Manhattan, in Austin, Nevada, to the three-foot ledges of lower grade ore in localities near the State line.

California Asphalt and Bituminous Rock.

The Colorado Western Railway Co., recently organized at Grand Junction, Col., is to build a road from that town through the asphalt region near Vernal and thence to Provo and Park City, Utah. Though the road is as yet only on paper, it was organized mainly to develop the asphalt fields of Utah. These fields are very extensive, but as yet Utah does not produce anywhere near the amount of asphalt that California does. California, Utah and Kentucky produce now all the asphalt and bituminous rock obtained in the United States, and California is by far the largest producer. Had Utah, however, proper transportation facilities, it could make an immense output and have an advautage over this State in comparative nearness to the larger cities of the East for a market.

There are many localities in California where asphalt is known to exist, but where it is not now mined owing to the expense of getting it to market. The abundant resources of this State in asphaltic materials ought to enable it in time to pretty well control the market in these materials, as Michigau and Montana do the copper With the exception of the Kern county fields, which have thus far been rather disappointing in results, the deposits lie mainly in the coast counties, where they have the advantage of both rail and water carriage. Several of the deposits are of remarkable purity and high standard, the output bringing in consequence good prices. The so-called bituminous rock found in Santa

(*Continued on page 308.*)

MINING AND SCIENTIFIC PRESS.

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San Francisco, November 17, 1894.

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THE State Miners' Convention will be called to order at 10 A. M. on Monday, November 19th, in Metropolitan Hall, on Fifth street, near Market, San Francisco.

INQUIRY regardiug the Yukon river region, Alaska, develops the fact that there are about 1000 people there, couuting miners, missionaries and traders. Wages are $6 a day, and "restaurant board" $12 per week. It is expected that next year the cost of carrying over the summit will be redneed from $15 to $5 per 100 pounds, and the time from Junean to Forty Mile Post shortened to ten days.

The Petroleum Interests.

The petroleum industry of California is one which is growing in importanee yearly. Already we stand about No. 5 in point of production as compared with other States. Petroleum lands stand on the eategory of placers in the eyes of the law, and are subject to the same conditions as to amount which can be located, etc. The provisions of the Stewart mining bill work the same hardships on this industry that they do upou drift mines. No company will nudertake to develop a petroleum claim until it has secured a large extent of territory, because of the expense required in the purchase of the adeqnate outfit to produce, refine and market petroleum in immense quantities. Appliances for sinkiug wells, pipe lines, cars for transportation, tankage and an elaborate bnsiness organizatiou must all be provided.

The probable ontput of a single forty-acre tract will seldom justify this expenditure, and limiting them to that area will prevent future companies from entering the indnstry on a large scale. It is necessary to perform annual assessment work on each forty-acre subdivisiou, with a total separate expenditure of $500 before a patent may be obtained. Very often, even on a large tract, it is desirable to confine the expenditure to one place. It is very difficult now to obtain patent to petroleum gronnd on aceonnt of the absnrd rnlings of the Land Office Department. Petrolenm must actually be produced in paying quantities, and it is not enough to show seepage or the ordinary indications which an operator recognizes.

The petroleum men are therefore just as much interested as the gold miner in bringing about the desired changes in present laws. They should join hands with the State Miners' Associatiou and add their influence to obtain relief from Congress.

A History of the Miners' Movement.

For many years the great gravel mines of California which were worked by the hydraulic process poured forth a flood of gold into the channels of commerce, adding millions to the wealth of the State and nation and sustaining many thriving communities throughout the mountain regions. At the same time, however, they poured forth a flood of debris or tailings into the channels of the rivers, more or less injuring the navigable streams and lands adjacent to the banks.

This resulted in the anti-debris agitation and long-continued litigation in the State and Federal courts. The farmers of the valleys vigorously opposed the miners of the mountains before the people and before the courts, and in the end won their fight. With a decisiou in a noted test case in their favor they were able to obtaiu injunctions upon mine after mine, until finally, with few exceptions, every hydraulic mine tailing into the streams of the drainage basins of the Sacramento and San Joaquin rivers was forced to cease active operations. This state of affairs continued for many years. The press and the general public, fearing the destruction of the navigable streams and bays of the State, aided the anti-debris leaders in their efforts to suppress hydraulic mining, and the miners found themselves in the minority. The decisions of the courts were unfavorable to the continuance of hydraulic mining under the conditions then prevailing, and these decisions appeared to meet with popular approval.

Gradually, as mine after mine was closed down, the men were discharged and these miners found their occupation gone. Quartz mining was not in those days as important a branch of gold mining in California as it has since become, and but few of the discharged men could find employment in their vocation. Great distress resulted in the communities in the mining regions. The smaller camps and towns became practically depopulated, and even the larger places in the regions affected by this cessation of mining were made to suffer.

Men long in comfortable circumstances found themselves without a dollar and unable to earn one in the only business they understood. The decisions against the miners amounted to a practical confiscation of their property, since, being unable to work them, the mines were without value. It was shown during the trials that upward of $100,000,000 had been invested in the hydraulic mines, ditches and works, yet not one cent could be realized from this. The mines could not be either worked or sold. Long and costly litigation had impoverished the miners who were now left penniless to begin life anew.

This condition of affairs not only affected the miners, but the merchants, tradespeople, mechanics and all the thousands who were associated with them. Real property throughout the mining region became practically valueless. People were moving away, there was no business, and houses and lots in the towns were not wanted.

This state of affairs continued for ten or twelve years, and though spasmodic attempts were made to work some mines, hydraulic mining was a dead industry in California. The first signs of a revival were seen when Governor H. H. Markham, in his inaugural address in 1891, called the attention of the Legislature of California to this neglected and oppressed industry, and suggested that the subject be thoroughly agitated, Congress be memorialized, and our Senators and Representatives urged to take all necessary steps to bring the subject properly before Congress at the earliest moment possible. He thought that the subject of the production of gold should be investigated by the Federal Government, just the same as that of irrigation was. He believed that if a proper effort was made, some solution of the problem could be found, and the people be benefited by the gold which would result from a resumption of operations of these mines. This suggestion of the new Governor came in the nature of a surprise to the miners as it was the first favorable word they had heard for years, from one with official influence, and this gentleman, moreover, had been elected, not from a mining, but from a farming community.

A committee of Senators and Assemblymen waited on the Governor and thanked him for his action. During the session of the Legislature, in accordance with the Governor's suggestions, a joint resolution was passed asking Congress to appoint a Commission to come to California to examine our rivers and hydraulic mines and take such action as would enable the hydraulic mines to resume operations.

In the meantime the Commission appointed by the Act of Congress in 1888 filed its report with the Secretary of War. This was the report of Lieut. Col. A. Benyaurd and Major Hanbury and Major Heuer, from which we have frequently quoted. It recommended the construction of impounding dams for the debris, and gave many encouraging facts for the miners, which led them to believe there was a probability of the hydraulic mines being again started after all.

Shortly after the publication of this report of the engineers, in the latter part of 1891, Thomas B. Everett, a working miner of Auburn, Placer county, suggested to Mr. Filcher of the Placer *Herald* the feasibility of calling a convention of the miners of that county to see if they could not take steps to have the hydraulic mines resume work. A call was issued and a number of miners responded. The subject was thoroughly discussed and an address issued to the people of California, setting forth the condition of the hydraulic mining industry and asking for assistance and relief. A call was also issued for a State Convention of miners, to be held in San Francisco, so as to obtain the assistance of all the mining counties.

It so happened that the editor of the MINING AND SCIENTIFIC PRESS was the only representative from San Francisco at the Placer county convention, and to him was therefore intrusted the preliminary work of interesting San Francisco people in the matter. On his return to this city the assistance of others was asked, and a meeting was called to discuss ways and means for organizing. Notwithstanding the fact that many had been asked to attend, there were only sixteen persons present at that meeting at the Mining Bureau rooms. Few thought much could be done, and many were lukewarm. Those who met, however, appointed committees to arrange for the State Mining Convention, and the subject was agitated in the local press. Many people then became interested, and it was soon evident that there had been a change of feeling with regard to the whole subject of mining debris.

In January, 1892, the State Mining Convention was held, and representatives from all the counties of the State were present. It was the most fully attended convention ever held in this city, and great enthusiasm was manifested. The attendance was not confined to miners alone, but representatives from the farming counties were invited to attend and assist in the deliberations. There was a somewhat unexpected reconciliation brought about between the mountain and valley representatives. The miners expressed themselves as willing to abide by the laws and to impound their debris in the future, on understanding which the valley men present were willing to withdraw opposition, it being agreed that Congress was to settle the question between the two factions. A memorial and resolutions were adopted and forwarded to Congress, asking relief on the basis of the report of the U. S. engineers.

A State Miners' Association was then organized, and branch associations formed in the different counties interested. The miners' appeal to Congress was backed up by suitable resolutions of the San Francisco City and County Supervisors, Chamber of Commerce, Board of Trade, and similar organizations, those of Alameda county, and the supervisors of the mining counties. The public press spoke favorably of the resumption of hydraulic mining and sympathy for the miners' cause was everywhere apparent and has since continued.

It is worthy of note that the greatest financial backing received by the miners has been from the merchants, manufacturers and business men of San Francisco. The San Francisco Board of Trade alone gave from its treasury fully four times as much money as the largest hydraulic mining company in the State. The business men of the metropolis recognize the fact that good times in the mining regions will increase their trade in all branches.

There was a long and expensive struggle before Congress to get the necessary laws. The Caminetti bill while pending was made the subject of heated

discussion, and it was evident that old prejudices had not entirely disappeared and that there were still fanaties on both sides of the controversy. The bill, after having suffered many amendments, was, however, finally passed, but in such a shape as to be somewhat unsatisfactory to the two contending factions. Then the State Legislature, which had previously passed a resolution asking Congress to pass the bill, enacted a State law in accord with the Congressional law. The organization of the State Association brought the miners of California into a closer relationship than had ever before existed since the discovery of gold in California. As a result, public attention was directed to the needs and condition of the mining industry in this State and the serious loss to commerce through the limitations that had been unfortunately placed upon the production of gold.

Our State Legislature, when its last session adjourned, left upon our statute-books two laws by which the State not only recognized the legitimacy of the business of hydraulic mining, but pledged financial aid to the extent of a quarter of a million of dollars to aid in its rehabilitation, conditioned only upon an appropriation of at least as much by the General Government In the meantime came the famous Gilbert decision in the North Bloomfield case, which, in substance, laid down the rule that hydraulic mining might be carried on when no material injury resulted therefrom, and further recognized the efficacy of artificial works for the restraining and impounding of mining debris.

This in brief is a history of the movement which finally resulted in the enactment of the Caminetti and the Ford laws. It took earnest and constant work on the part of the Executive Committee of the California Miners' Association to carry out the plans of the convention, but the efforts of those interested were finally successful. As a result, there are about fifty hydraulic mines now legally operating in the region formerly affected by the debris question, and twenty-five or thirty more have their applications for license pending.

As is generally known, the essential features of the new Federal law are that the miners, in order to work claims by the hydraulic process, must provide impounding works in which to store the debris so as to prevent it passing into the navigable streams or their tributaries. The whole matter of operating these mines is placed in the hands of the California Debris Commission, who alone have the right to issue licenses to mine by the hydraulic process in the drainage basin of the Sacramento and San Joaquin rivers. They prescribe the character of the impounding reservoirs and have the right to revoke a license if in their opinion the mine does any damage to the streams. Under these conditions the output of the mines working is limited by the capacity of the settling reservoirs, and the mines cannot be as productive or profitable as when the debris took care of itself and there was no limit to the quantity of gravel which could be washed. At the same time hydraulic mines can now be legally worked in these drainage basins, whereas, before the passage of the Caminetti law, they were all closed down by injunction.

The second conveution of the miners took place in October, 1893. The principal matter before it was the Stewart mining bill, then and now pending before Congress. The objectionable features of the bill were pointed out, and several desirable amendments suggested. It was also the sense of the convention that a new section should be added to the Federal mining laws as follows:

That the officers of the land department of the Government, in construing the provisions of the law relative to the acquisition of the title of the Government to its mineral lands by its citizens, shall construe and apply the same with great liberality, with a view to aid the applicant in procuring said titles, and that the rules and regulations prescribed by said department for its government and that of its officers in disposing of said lands shall be so formulated and administered as to assist the Government in disposing of said lands to bona fide applicants, and not so as to impede said sales or impose onerous burdens on applicants.

A committee was also appointed to draft a mining bill as a substitute for the Stewart bill, which should be more in accordance with the ideas expressed by the miners in their conventiou. This work was done, and resulted in the so-called Newlauds mining bill, which has been introduced in Congress. Both this and the Stewart bill are published in full in this number of the PRESS.

The only action of the convention in regard to hydraulic mining was that the exact sum ($1,030,000) recommended by the Government engineers for impounding works was asked for; and an amendment to the Caminetti Act was further suggested, providing that hydraulic mining may be undertaken with no impounding works whatever, if it appears to the Debris Commission that no material injury to others will result.

In addition to these things Congress was asked to make liberal appropriations for the improvement of the navigable streams of California. It was resolved, moreover, that a display of the mineral products of California should be made at the Midwinter Fair by the California Miners' Association.

Congress has not yet passed either the Stewart or Newlands bill, so that these measures will doubtless be the main subjects of discussion at the convention next week. In fact, the principal work before the miners is in relation to the Federal mining laws.

The miners of this State are now thoroughly organized and in a better position than ever before to obtain recognition before Congress and the Legislature. The people of the State have been made to see the importance of the mining industry and are favorably inclined toward it. The old factional opposition only exists in a slight degree, and the people of California are desirous of assisting the miners in every way.

San Francisco County Miners' Association.

A meeting of the Miners' Association of the City and County of San Francisco, the local branch of the State Miners' Association, was held in the Chamber of Commerce rooms on Monday, with Mr. Geo. W. Grayson in the chair.

On motion of Mr. Sonntag a committee of five was appointed to report in fifteen minutes a list of names as delegates to the State convention. This committee consisted of Julian Sonntag, Ed. H. Benjamin, W. C. Ralston, A. G. Myers and Chas. G. Yale. Upon their report the following delegates to represent San Francisco county in the convention were selected:

Judge Niles Searls, E. A. Belcher, J. Sonntag, C. W. Cross, W. C. Ralston, Thomas R. Church, S. K. Thornton, Charles G. Yale, Andrew Carrigan, John T. Dare, A. J. Ralston, E. H. Benjamin, W. W. Montague, James Spiers Jr., John Bermingham, A. H. Ricketts, Ross E. Browne, Henry Pichoir, G. W. Grayson, Thomas J. Barbour, S. J. Hendy, B. T. Lacy, Joseph Selby, Edward Coleman, John Coleman, J. J. Crawford, F. W. Moebus, John Scott, G. A. Dow, Claude T. Hamilton, Frank J. Fletter, B. B. Thayer, W. F. Hasson, A. J. Rudgear, A. Hayward, James Cross, S. B. Christy, W. S. Edwards, William Irelan Jr., John Ballard and J. B. Treadwell.

The committee were empowered to substitute other names for those who were unable to attend.

Mr. Yale and Mr. Ralston addressed the meeting, urging an attendance of all the delegates, and explaining the objects desired to be accomplished by the convention.

It was resolved to appoint a committee to revise the constitution and by-laws of the State Association, and bring the proposed changes before the Executive Committee. The committee consists of the president, vice-president and secretary of the San Francisco association. Mr. Dunham being absent, Mr. Sonntag was appointed in his place on the committee.

The following officers were elected for the ensuing year: President, Geo. W. Grayson; vice-presidents, A. J. Ralston, S. J. Hendy, B. F. Dunham, E. A. Belcher and Thos. R. Church; secretary, Charles G. Yale.

Officers of California Mining Associations.

The California Miners' Association is composed of members of mining associations in the different mining counties of the State. The officers of the State associations and secretaries of the county associations are as follows:

California Miners' Association.

President.....Hon. J. H. Neff
Vice-President.....S. K. Thornton
Treasurer.....J. Sonntag
Secretary.....W. C. Ralston

EXECUTIVE COMMITTEE.

Hon. J. H. Neff, Placer Co., Chairman.

At Large.—Chas. G. Yale, C. W. Cross, Henry Pichoir, S. J. Hendy, S. B. Christy, R. McMurray, Edward Coleman, E. A. Belcher, A. J. Ralston, B. F. Dunham, W. W. Montague, A. S. Hallidie, John Bermingham, Thos. R. Church and Tirey L. Ford.

Alameda Co.—Felix Chappellet, J. T. Bradley.
Amador Co.—E. C. Voorhies, J. F. Parks.
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Calaveras Co.—S. Foorman, E. Taylor.
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Nevada Co.—J. S. McBride, A. Tregidgo.
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Plumas Co.—W. N. Goodman, W. W. Kellogg.
San Francisco Co.—John C. Coleman, S. K. Thornton.
Shasta Co.—J. E. Lyon, A. B. Paul.
Sierra Co.—Dan T. Cole, Frank R. Wehe.
Siskiyou Co.—R. H. Campbell, Andrew G. Myers.
Trinity Co.—John McMurray, O. M. Loveridge.
Yuba Co.—W. B. Meek, Jas. O'Brien.
Committee on Legislation.—Tirey L. Ford, E. A. Belcher, Chas. G. Yale.
Committee on Finance.—S. K. Thornton, W. W. Montague, B. F. Dunham, S. J. Hendy, Edward Coleman.
Auditing Committee.—W. W. Montague, B. F. Dunham, Dan T. Cole.

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President.....G. W. Grayson.
Vice Presidents....A. J. Ralston, S. J. Hendy, B. F. Dunham, E. A. Belcher, Thos. R. Church.
Secretary.....Charles G. Yale.

SECRETARIES OF THE DIFFERENT COUNTY ASSOCIATIONS.

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A. J. Meroux, Downieville.....Sierra
A. B. Call, Amador City.....Amador
G. A. Richardson, Placerville.....El Dorado
C. R. Thompson, Spanish Ranch.....Plumas
C. B. Rutherford, City Wharfingers' Office, Oakland.Alameda
Clay Hampton, Bridgeport.....Mono
C. Runckel, Colfax.....Placer
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J. J. Rolfe, Assistant Secretary, Nevada City.....Nevada
H. V. Reardon, Oroville.....Butte
Ira Hill Reed, San Andreas.....Calaveras
Louis Heller, Fort Jones.....Siskiyou
C. C. Busb, Redding.....Shasta
Chas. G. Yale, U. S. Branch Mint, S. F.....San Francisco

Desirable Mining Law Changes.

The vital changes in the present mining laws proposed to be made by the Newlands bill, elsewhere printed, have all been duly considered by the special committee of the California Miners' Association. They include several provisions to be found in the Stewart bill, but omit all that have been declared undesirable by the Miners' Convention of last year. Several provisions which the Stewart bill proposes to omit are restored by this bill. It may be, however, that, on consideration; the Miners' Convention of next week will decide to abandon the effort to pass the so-called Newlands bill and endeavor to graft its provisions upon the Stewart bill in the shape of amendments, in the House. The latter bill has already passed the Senate, and it might be easier to amend it than to obtain recognition for an entirely new measure.

In the Newlands bill, as at present drawn, it is proposed to define in a clearer manner the method of making locations of mining claims, that paragraph in the Revised Statutes being made to read as follows, the words in italic being inserted in the new bill:

The location must be distinctly marked on the ground *by posts or monuments*, so that its boundaries can be readily traced.

The following modification as to the period in which assessment work shall be done, is made:

"That the period within which the work required to be done annually on mineral claims shall commence at 12 o'clock *meridian* on the first day of January succeeding the date of location of such claim. When the labor required by this act shall have been performed or the improvements made, an affidavit may be filed within thirty days after the time limited for performing such labor or making such improvements with the Recorder of Deeds of the county in which the claim or mine is situated, particularly describing the labor performed and improvements made, and the value thereof, which affidavit shall be prima facie evidence of the facts therein stated. And upon a failure to comply with the conditions of this act in the performance of labor or making of improvements, the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location of the same had ever been made."

This paragraph is all new matter.

A succeeding provision is altered to read as follows, the words "a patent" being replaced by the words in italics:

On all claims located prior to the tenth day of May, eighteen hundred and seventy-two, ten dollars' worth of labor shall be performed or improvements made during each year for each one hundred feet in length along the vein, until *payment of the purchase money and a certificate of entry* has been issued therefor; but where such claims are held in common such expenditure may be made upon any one claim.

This is in accordance with the express recommendation of the State Miners' Association. The following new provision is added in cases of notice upon co-owners who fail to contribute their share of expenditure for assessment work:

A copy of such notice, together with an affidavit showing personal service or publication, as the case may be, of such notice, when filed and recorded with the Recorder of Deeds of the county in which such mining claim is situated, shall be evidence of the acquisition of title of such co-owners.

Section 2334 of the Revised Statutes is amended by adding thereto the following:

And the surveyors appointed under the provisions of this section shall have power to administer oaths to their assistants.

Section 2335 is amended by the following:

SEC. 2335. All affidavits required to be made under this chapter may be verified before any officer authorized to administer oaths *within the State or Territory where the claim may be situated, having an official seal.*

The present law requires that such affidavits shall be verified within the land district where the claim is situated. The provision, recommended by the Miners' Association, that the presence of rock in place bearing gold, silver, etc., shall be regarded as presumptive evidence that the land is, and always has been, mineral in character, is inserted; together with the provision defining how land shall be determined to be more valuable for mineral than agricultural purposes, and providing that this chapter shall be liberally construed by the Laud Departmeut.

Section 2337, relating to mill sites on non-mineral lands, provides that such lands used or occupied, or *intended to be used or occupied*, may be embraced in an application for a patent, or may be made in a *separate* application for a patent. Locations of such character may reach a maximum of *ten* acres instead of five, as at preseut.

THE Chamber of Commerce will be represented at the Miners' Convention by Geo. W. McNear, A. J. Ralston and Robert Watt. The San Francisco Stock and Exchange Board will be represented by M. J. McDonald, Geo. T. Marye Jr. and Geo. Ives. The Board of Trade will be represented by A. A. Watkins, A. J. Folger and Alonzo Scott.

THE Executive Committee of the California Miners Association has held several meetings within the past two weeks, on business mainly relating to details of the coming convention.

California Asphalt and Bituminous Rock.

(*Continued from page 305.*)

Cruz, Monterey, San Luis Obispo and Santa Barbara counties is coming into constantly increasing use as a paving material. We receive in San Francisco now from 40,000 to 60,000 tons of tbis material a year. The output is only limited by the demand, there being immense beds in the counties named. This substance is rapidly taking the place of hasalt blocks as a paving material in the cities of the coast, and when properly laid is quite satisfactory. It is uot as good as the true asphalt, but that is more expensive in first cost. To sbow tbe valuc of tbese interests to California, it may be stated that tbe value of tbe asphalt and bituminous rock produced in the State last year was upward of $350,000.

Gravel Mining in Missoula Co., Montana.

The Butte *Miner* correspondent has frequeutly referred to the change which bas beeu going on for the past tbree or four ycars in the metbods of mining the large deposits of auriferous gravel in portions of Missoula county.

The old-time plan of sboveling into rockers or sluice hoxes is being superseded hy more scientific work on a larger scale than heretofore. It is evident that this is the only salvation for tbe placer mining industry of this section. The rich and shallow diggings have been worked out, and there is very little ground left that can he worked by old-fasbioned methods and made to pay fair wages to the miner. If the primitive manner of placer mining were adbered to tbe annual yield of placer gold from western Montana would soon sink into insignificance. It is true that in the various portions of the county there are a uumber of placer miners working in the heds of the gulches drifting, and some of them are said to be makiug good wages, hut the yield from this source is small and does uot in the aggregate cut much of a figure in the total amouut of the gold product of tbc country.

The placer-mining yield of this district must, in the future, depend ou the working of the large beds of gravel in the gulches, and which requirc the investment of capital and the application of scientific appliances aud large heads of water. Long bedrock flumes, ditches, giant hydraulics and large derricks for baudliug rock are beyond tbe means of the ordinary iudividual placer miner. These things require capital, lahor and time to put them in operation. The La Cass brothers, who inaugurated this system in Cedar Creek, in the western portion of Missoula county, have heen remarkahly successful, but it required much hard labor, and several years of it, to place their property in tbe condition which it is in to-day—tbat of a bigbly profitable placer mine. The effect of their success bas been to eucourage investmeuts iu other enterprises of a sinilar nature. Oue of these is tbe opening of California gulcb, a tributary of Cedar, by means of a large bedrock flume aud hydraulic. The California Gulch placer mine is owned and operated hy Messrs. Wolf, Blaisdell and Foster. Rohert Foster, one of the owners, is an old-timer, and is well known all over the Pacific coast.

This is the first season tbat this compauy has been ahle to cleau any bedrock, but the results bave been highly satisfactory and demonstrated that the owners have a comfortable fortune in the property. There are six to seven feet of gravel at the bedrock, which yields from fifteen to twenty cents to the pan. This season's work has just fairly opened up the ground, yet it has yielded a handsome profit. They will be able uext season to handle their ground much more rapidly and economically. An English company is negotiating for the property, and it is reported that they have taken it. The figures are understood to be $50,000. The same company is negotiating with Bassett aud La Cass brothers for the Cedar Creek claims, the price to bc paid being $100,000.

A Salt Lake company operating near the mouth of Quartz creek has two large bedrock flumes and two giant hydraulics. They have haudled a large amount of gravel this season, but as it is a close corporation, nothing has been learned as to tbe amount of gold obtained. There are several other enterprises of a similar uature in the gold belt west of Missoula, but most of them have not reached a point in development that could he expected to yield large results. There are a number of gulches in the western part of the couuty that coutaiu from twenty to seventy-five feet of gravel over bedrock, and which offer promisiug fields for tbe investment of capital. Shallow portions of the gulches have paid well in the early days, but tbe ground remaining, to be profitably worked, requires the adoption of methods by which large amounts of ground can be washed economically. When a system of this descriptiou is generally introduced, it is certain that Missoula county can yield for many years to come large sums of placer gold.

What Electricity Is.

Ahout the best auswer we bave seen to this oft asked question appears in the current number of the *Science Review*. As a matter of analogy, tbe author modestly contrihutes to tbe stock of knowledge on this suhject in this wise:

"Do you suppose we will ever know what electricity is?" As I bave been asked tbat question more frequently than any other since I hecame an electrician, I will try to clear the electrical atmosphere a little, and endeavor to bring this apparently mysterious agent down to the level of those forces witb which we consider ourselves on more familiar terms, and in this attempt the reader is presumed to have only a common school knowledge of matters scientific.

Before considering, however, tbe immediate question what electricity is, it will be well to ascertain first what we really know ahout other natural forces, such as gravitatiou or heat, both of which we observe in daily operation with a sort of contempt that is born of familiarity.

What, theu, is gravitation?

After a little reflection, we are compelled to admit that it is quite beyoud our powers to define clearly wbat gravitation is. We can only say at hest that a terrestrial force affects all material hodies in accordance with certain fixed principles called the laws of gravitation, and on askiug some professor of science the question, he replies: "Gravitation is a manifestation of energy, and its laws are so and so."

Let us try again. "What is heat?"

Heat, we say, is a mode of motion, hut we at onee coucede that this definition is ratber unsatisfactory, aud does uot give us a clear idea what heat is. We know, however, that heat affects different material substances differently. The same degree of heat, for instance, melts one substance and freezes another, and we make daily use of this kuowledge.

Going again to the professor of science, he replies as before, that "Heat is a manifestation of energy, and the laws of its action are so and so." We note that his answer is the same to both questious, so he has made at least one significant idea plaiu, which is this: Both heat and gravitation are manifestations of energy, and so far at least arc one and the same thing. The only important thing, after all, seems to be a kuowledge of the laws that explain the action of these forces when at work, for this alone makes them subservient to our needs.

Every form of force, tberefore, should be regarded as a different method or way in which the same thing, morc properly spoken of as energy, makes itself known to the senses.

Of energy itself we can have no intrinsic knowledge, because it is intangihle and invisible; and electricity is no more mysterious in this respect than heat or gravitation. It is fortunately placed witbin our power to learn by study and experiment the laws that control the action of any force, and it is, indeed, a great thing to say, even in tbis uineteentb century, that the laws defining the behavior of electricity, though of comparatively recent date, are as clearly formulated and as thoroughly understood as are those concerning heat or any known force.

The expression, "Energy in the form of heat, energy in the form of electricity," etc., is a trifle clumsy, but very conducive to clear reasoning, and leads us to the cousideration of an important law of nature, which, thoroughly grasped, will bring the auswer to our question, "What is electricity?" clearly into view.

This law is known as the principle of the conservatiou of energy, and teacbes that energy or force, like matter, is indestructible. Thus, for illustration, a smith beats a nail with a hammer—raising the hammer against the gravity force, he brings it down with considerable power. He is not only doing work, but he seems to be expending or actually destroying energy, for to the superficial observer a certain amount seems to disappear at every blow, but the principle we are now discussing tells us this cannot be the case. It tells us that force cannot be got rid of, it only seems to disappear by changing form, always appearing somewhere else in a new guise or dress. Thus, as the nail is hammered, we soon become aware of a new form of euergy that has appeared upon the scene without any appareut reason or excuse for its presence. In fact, tbe uail has become hot, and the question arises, Where did this new energy in the form of heat come from?

We now know that the heat apparently born of the action of hammering is the mechanical energy expended by the smith appearing in a new form; it is the same identical energy that was delivered to the nail by the blows of the hammer, and precisely the same amount. That is the conservation of energy.

Having the law clearly iu mind, we are prepared to attack the main question, "What is electricity?" for the law says that all force is one, though its guise or form of manifestation may be undergoing ceaseless change.

Take an illustration that comes a little nearer to our subject. Nothing at first appears so mysterious as the attraction a magnet exerts upon a piece of iron or steel, but this is only because we are not aceustomed to deal with this form of attraction, and on reflection we are forced to the conclusion that maguetic attraction is uo more to be wondered at tban the attraction of gravitation; both are phenomena of nature, and hoth are equally calculated to excite surprise at first view.

Whenever a force of attraction holds two bodies together, or tends to do so, we use some other force, generally in the form of heat, to separate them. Thus a heavy body rests upon the earth, held there by gravity; to lift it we use mechanical energy. In some way, however, this mechanical force always comes from heat, as when a steam engine is made to do the work; or if muscular power he used, as that of a man or a horse, the power is still traceable to the same source, for in this case also the force exerted originates iu the heat energy of the food, made available for use hy combustion in the body, which is furnace, hoiler and engine all in onc machine, and wbich enables us to exert the muscular power derived from the heat energy of food in a useful way.

If, on the other hand, gravity attraction is free to work hy causing a weight to fall from a height, theu whenever the falling body is either arrested entirely in its course, or its motion is merely cbecked by a resistance, the gravity force at work passes to the heat form.

These transformations between mecbanical energy and heat are quite generally understood. Tbey are merely dwelt upon here because of tbe close parallel that follows when we apply tbe principle of the conservation of energy to cases less familiar.

Return now to tbe magnet which holds a piece of iron so firmly that it requires considerahle foree to tear it away; and suppose power he applied to remove it! Wbat hecomes of the mechanical energy thus exerted? It seems to have passed entirely out of existence, and it will require the closest scrutiny to follow the elusive changes of force that take place in this simple act of separating the iron from the magnet. We may he sure, however, that thc force has heen neither lost nor destroyed, and we must look for its appearance somewhere in the system in which the mechanical force was expended.

Continue for some time to rapidly apply the piece of iron to the magnet, and as quickly pull it away again. It will in time hecome warm, and eventually hot, as a result of this process, aud so will the magnet also, though in a less degree.

Here then is force, that was origiually exerted in the mechanical form, as push and pull to overcome the attraction of the magnet, appearing as heat in thc piece of iron, and it looks very much as if we had simply convertcd mcchanical euergy into heat, as before explained. Energy, however, is often very elusive in passing from oue form to anotber, and closer investigation in this case will show that the change from the mecbanical to tbe beat form involved another step wbich escaped our notice, simply because the intermediate form of force was not evident to the senses. Thus our senses, too completely relied upon, are apt to cheat us sometimes. The truth of the matter is tbat tbe mechanical action of pulliug the piece of iron away from the magnet and putting it hack, set up electric currents in the mass of the iron, which, though not apparent to the eye or the sense of toucb, could he deteeted hy a compass; and these currents flowing hack aud forth in the irou beated it, because every conducting suhstance, however good a conductor of electricity it may be, opposes some resistance to the flow of electricity tbrough its mass; and if the electricity is forced through it against this resistance, the eonductor will bc heated as a cousequence. We see, therefore, that two transformations took place in the iron instead of one.

Mechanical force applied to remove tbe iron from the magnet was first changed to the electric form of energy, existing as electric currents in the iron, but discoverable only with a compass or other suitable instrument, and not evident to the senses. The iron, however, opposing a resistance to the flow of the electric currents in its mass, altered the energy again to the heat form, when it became again evident to the senses; but in passiug through these different stages, it was always one and the same energy, different conditions aud resistances having twice quickly altered its form or mode of manifestation.

It is importaut here to note how resistance of one kiud or another is always the ageut that acts to alter energy from oue form to another. The attraction of the magnet (magnetism) opposed a resistance (mechanical) to the iron being pulled away; hut this resistance was overcome, and the original forces were altered instantly by the resistance to the electric form, existing momentarily as electric currents in the iron. Tbe iron opposed, however, an inhereut resistance to the flow of electric currents through its mass, hut they must flow hecause the irou was forcibly pulled away in the first place—the fact which started all these changes going and which must come to a logical end. The resistauce the iron opposed to electric flow was therefore overcome, but as a direct result the force at work (electricity) has again changed form, and now appears as heat, in which form it is radiated and dissipated into surrounding space.

It would, therefore, appear that electricity, as we

have here observed it, is simply a form or manifestation that the one force better spoken of as an energy may assume under given conditions, and generally, as in the case cited, it is a more transitory stage between the mechanical form and the heat form.

In most operations mechanical force passes to the heat form without passing through the electric form, but whenever magnetism is brought into play as a resistance that must be overcome, then mechanical power applied to overcome this resistance always becomes electricity, if only momentarily in its passage from the mechanical to the heat form.

Can we now answer in a fairly satisfactory way the question, "What is electricity?" by saying that it is simply a form that energy may assume while undergoing transformation from the mechanical or the chemical form to the heat form or the reverse?

In this attempt at a definition I have purposely referred to energy in the chemical form, not heretofore referred to, as it is not apparent from the illustration given where the electric current of a battery comes from, and how, in this case, it is also traceable to a mere transformation of energy.

There are, fortunately, many ways of obtaining energy in the electric form; but in nearly every case, if not quite all, it will exist as a transitory state of energy in its passage from some other form to the heat form. Thus, in the case of a battery, we start with energy in the chemical form, by which we mean the affinity or strong tendency that an acid has to unite with a metal to form a new combination, this chemical energy or affinity being a potential force of nature, like gravitation or magnetism.

As long as the circuit of the battery is closed, or, in other words, as long as a path is afforded for the electric current to flow, the chemical change will go on. When the path is broken or interrupted in any way, the chemical change will practically cease, because no transformation to heat through the electric form can now take place. While, however, the path is closed, chemical change is going on, an electric current is flowing through the wire path, the wire becomes heated, and there is dissipation of heat by radiation from the wire, in direct proportion to the amount of chemical energy expanded; but the energy, before appearing as heat, has been momentarily in the electric form, and can be discovered by placing a compass under the wire path, which is made hot by the invisible and intangible electric current.

Thus the definition derived from our simpler illustration holds also true in this case, and the conservation of energy, rigidly applied, will thus make the existence of force in any form clear to the eye of the mind.

ELECTRIC COAL DRILL.

Electric Coal Drill.

A small portable electric drill, for use in both anthracite and bituminous mines, has been recently brought out by the General Electric Company. The drill is similar to the well-known Howells drill with an electric motor geared to it in such a way as to form a light and efficient tool.

The control of the motor is effected by a small plug switch. No rheostat being used, power may be taken from the same wire supplying current for lighting, pumping or haulage.

Feed screws of different pitch are furnished for varying the speed of boring and a friction clutch protects the motor should any particularly hard obstacles be struck suddenly.

The columns are made in different lengths and each is adjustable for about two feet variation. The construction of the drill and its method of mounting enable the operator to drill close to the roof, floors or walls as well as in any direction.

Valuation of Foreign Coins for Customs.

The practice of fixing a value of foreign coins for appraisement purposes, says the *Bulletin*, has been in operation for twenty years. It was first established by an act of Congress March 3, 1873, entitled "An act to establish the custom house value of the sovereign or pound sterling of Great Britain, and fix the par of exchange." The law made it the duty of the Director of the Mint to fix such values and proclaim them on the 1st January each year. The first publication was made January 1, 1874, and thereafter annually until October 1, 1890, when the law was amended so as to require these publications to be made quarterly.

The necessity for this change grew out of the rapid fluctuations in the price of silver and its downward tendency. The first publication under the new law was made October 1, 1890, and they have since been made every three months. The values of the silver coins of the different countries are fixed on the average price of fine silver for the previous three months, computed on the number of grains and fineness of the coins. The object is to ascertain, as nearly as possible, the gold value of these coins for the purpose of fixing uniform values of foreign goods entered into the United States for appraisement purposes so as to insure an equitable rating of such values under the existing tariff.

Parties who import goods from sections where Chile money is used do not understand why appraisements of values should be made on the basis of 91.2 to the peso, or dollar, instead of the market value of such coins in this country, which for some time past has been from fifty cents to fifty-two cents. If these coins are bought here at those rates and used in the purchase of goods from countries or sections using Chile money as currency, it is difficult to see why goods for which 1000 of these coins have been paid at a cost of $500 to the importer should be valued at $912 for the purpose of fixing the duty on the same. When the duties are ad valorem, it makes a large difference whether the Chilean peso is valued at 91.2, as fixed by the Director of the Mint, or 50, as fixed by commercial usage.

It is noted that the Director of the Mint does not pursue the same policy as to the value of the monetary unit in all countries. This is true of several countries. For example, the franc of Belgium, France and Switzerland is 19.3, just as it has been right along for several years. There has been no change in the value of the mark of Germany, the drachma of Greece, the lira of Italy, the pseta of Spain, or the peso of the Argentine Republic, Chile and Cuba. All these are silver coins, and all these countries are on the gold and silver or bimetallic basis. That, indeed, may be the reason why these silver coins have not been reduced in value. Of course, if these countries use both gold and silver interchangeably, redeeming their silver in gold whenever called upon to do so, the case is altogether different from silver-using countries. We presume that is the explanation of the matter in some cases.

It is not true, however, of the peso of Chile. This coin corresponds to the silver dollar. Its commercial value outside of Chile is no greater than the commercial value of the Peruvian sole or the Mexican dollar. Its gold value in Chile is slightly under the gold value of the other coins named in their respective countries. Chile does not redeem its pesos in gold. The Mint Director's valuation of this coin has been 91.2 cents for several years. Such valuation for appraisement purposes is evidently wrong. It should be put on the same footing as the Peruvian sole and the Mexican dollar.

It is interesting to observe in this connection the great restriction in the value of silver coins of silver-using countries, as fixed by the Director of the Mint on October 1, 1890, the first date under the law requiring quarterly publications and the 1st October, 1894. The comparison is as follows:

	October—	
	1890.	1894.
Boliviano of Bolivia	$0 69.4	$0 46.4
Peso of Central American States	69.8	46.4
Shanghai Tael of China	1 03.1	68.5
Haikwan Tael of China	1 14.8	76.3
Peso of Colombia	69.8	46.4
Sucre of Ecuador	69.8	46.4
Rupee of India	32.2	22.7
Yen of Japan	75.2	50.0
Dollar of Mexico	75.8	50.0
Sol of Peru	69.8	46.4
Ruble of Russia	55.8	37.1
Mahbub of Tripoli	62.9	41.8

The average decline in the value of these coins is about 33⅓ per cent.

The Bartlett Process.

The new mill of the Bartlett Process Reduction and Mining Company, which is being built at Gillett, in Beaver Park, Colo., is expected to solve the problem of treating successfully the low-grade ores of Cripple Creek district. The company's prospectus says: "The ore is ground by means of heavy hollow rollers in which cannon balls revolve. The roller revolves in a circular steel pan, there being a series of rollers and pans, and the rock, in passing from pan to pan, is ground to a powder far finer than that obtained by any other system of stamps or rolls. The most minute particles of free gold are by this means separated from the rock. The powder is treated by means of chemicals, which amalgamate the free gold and take into solution a small quantity of combined gold. Under the ordinary method of treatment, large quantities of gold are lost from rusted or greased surfaces or from a combination with gangue matter. These conditions prevent the gold from adhering to the mercury-covered plates, but in the Bartlett process this is entirely obviated.

"The doctor worked for three months testing ores from the Ida May, Buena Vista, Elkton, Portland, Ingham, C. O. D., Raven and Anacouda. The percentage of gold saved was from 70 to 89 per cent, the highest being from $11.20 ore from the Summit, and the lowest from $20.40 ore from the Anacouda.

"The treatment of free-milling ore will cost 55 cents a ton. The charges made will be $3, and from 70 per cent of the assay value up will be paid to the owners. The Bartlett process will pay the mine owner $4 net on $10 ore, and the delivery of the ore to the mill will be at an additional cost of from 60 cents to $1 per ton. As the mill will work 100 tons of ore a day the profit of the process over any mill will be readily appreciated. More refractory ores will require roasting, but the percentage of saving will be greater. The charges on this treatment will be $4 per ton.

"An important feature of the mill will be complete rotary roasters, which will have a capacity for handling 100 tons a day. This can be done at a cost of about 75 cents per ton, and will add largely to the saving of gold that otherwise will pass off in the form of tellurides, or combined with the sulphides of iron."

Gold From Smoke.

The Omaha and Grant Smelting Works are putting a new device at their smelters in Omaha and Denver to recover the minerals that now pass away in smoke and fumes. It is not generally known that the smoke from such plants is laden with metals of value notably, gold, silver and lead, but such is the fact. It has been the constant study of metallurgists for years past to devise some practical and economical method that would condense this material. The new device is briefly described as follows:

A horizontal flue some 1,500 feet in length, exposing a surface for radiation and condensation of the heated gases of upward of 54,000 square feet. Through this flue are drawn the flumes by means of a fan, outer circumference of which, at full speed, revolves at a velocity of nearly two miles a minute. The flumes now under pressure, are forced into a spacious building, from which there is no means of escape, except through a filter of textile fabric, the colorless gases passing through into a stack beyond, while the valueable soot or smoke condenses on the inner or lower side, from which it is collected from

time to time, compressed into molds and fed back again into the furnaces, where the valuable metals are extracted and separated. It may be of interest to note that there will be 10,000 square yards of filtering material and not one particle of valuable fume can escape.

It is proposed to complete these improvements in the shortest possible time, probably six weeks or two months.—Ex.

The Stewart Bill.

IN THE SENATE OF THE UNITED STATES.

JANUARY 29, 1894.

MR. STEWART introduced the following bill, which was read twice and referred to the Committee on Mines and Mining.

MARCH 20, 1894.

Reported by MR. STEWART with amendments, viz.: Omit the parts in SMALL CAPS and insert the parts printed in *italics*.

JUNE 15, 1894.

Passed the Senate.

A BILL

To amend chapter six of title thirty-two of the Revised Statutes, relating to mineral lands and mining resources.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section twenty-three hundred and twenty-four of the Revised Statutes be amended so as to read:

"SEC. 2324. The miners of each mining district may make regulations, not in conflict with the laws of the United States or with the laws of the State or Territory in which the district is situated, governing the location, manner of recording amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground by posts or monuments, so that its boundaries can be readily traced. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location, and such a description of the claim or claims located as will identify the claim. On each lode claim located after the tenth day of May, eighteen hundred and seventy-two, and until payment of the purchase money and a certificate of entry has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year. On all lode claims located prior to the tenth day of May, eighteen hundred and seventy-two, ten dollars' worth of labor shall be performed or improvements made during each year for each one hundred feet in length along the vein until payment of the purchase money and a certificate of entry has been issued therefor; and for each twenty acres of placer claims, and for each subdivision thereof less than twenty acres, TEN *fifty* dollars' worth of labor shall be performed or improvements made during each year until payment of the purchase money and a certificate of entry shall be issued therefor. But where several adjoining lode claims, not exceeding five, are owned or held by the same person, association or corporation, and the sum of five hundred dollars or more is expended in any one year in good faith for the development of all of the claims so owned or held, not exceeding five, there shall be no requirement for separate labor or improvements to be performed or made on the several claims so owned or held during such year. The year within which the annual labor or improvements required to be performed or made by this section shall commence at twelve o'clock meridian on the first day of October of each year: *Provided*, That upon claims located previous to the first day of March in any year the annual labor or improvements shall be performed or made on such claim for that year prior to twelve o'clock meridiau of the first day of October next succeeding; and upon claims located after the last day of February and prior to twelve o'clock meridian of the first day of October in any year the annual labor or improvements required shall be performed or made within one year from twelve o'clock meridian of the first day of the succeeding October: *And provided further*, That only one-half of the annual labor or improvements required by this act shall be necessary to be performed or made prior to twelve o'clock meridian of the first day of October, in the year eighteen hundred and ninety-five, but after the first day of October, in the year eighteen hundred and ninety-five, the full amount of labor or improvements required by this act sball be performed or made upon such claims as in all other cases during each year prior to twelve o'clock meridian of the first day of October. In case the first day of October falls on Sunday or any holiday the following secular day shall be construed as the first day of October within the meaning of this Act. When the labor required by this Act shall have been performed or the improvements made an affidavit may be filed within thirty days after the time limited for performing such labor or making such improvements with the recorder of deeds of the county in which the claim or mine is situated, particularly describing the labor performed and improvements made, and the value thereof, which affidavit shall be prima facie evidence of the facts therein stated. And upon a failure to comply with the conditions of this Act in the performance of labor or making of improvements, the claim or mine upon which such failure occurred shall be opeu to relocation in the same manner as if uo location of the same had ever been made: *Provided*, That the original locators, their heirs, assigns, or legal representatives, do not resume work upon the claim after such failure and before such relocation, and coutinue the same with reasonable diligence until the required amount of labor shall have been performed or improvemeuts made; but no relocation of a claim by a person who has already located such claim and failed to comply with the conditions of this Act in performing work or making improvements shall be valid prior to such resumptiou and continuaunce of work upon such claim. Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required hereby the co-owners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent co-owner personal notice in writing or notice by publication in the newspaper published nearest the claim, for at least ouce a week for ninety days, and if at the expiration of ninety days after such notice in writing or by publication such delinqueut shall fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditures. A copy of such notice, together with an affidavit showing personal service or publication, as the case may be, of such notice, when filed and recorded with the recorder of deeds of the county in which such mining claim is situated, shall be evidence of the acquisition of title of such co-owners. Where a person or company has or may run a tunnel for the purpose and with the intent in good faith of developing a lode or lodes owned by said persou or company, the money so expended in runniug said tunnel shall he taken and considered as expended ou said lode or lodes: *Provided further*, That said lode claim or claims shall be distinctly marked on the surface, as provided in this Act."

SEC. 2. That section twenty-three hundred and twenty-five of the Revised Statutes he so amended as to read:

"SEC. 2325. A patent for any land claimed and located for valuable deposits may be obtained in the following manner: Any person, association, or corporation authorized to locate a claim under this chapter, having claimed and located a piece of land for such purpose, who has, or have, complied with the terms of this chapter, may file in the proper land office an application for a patent, under oath, showiug such compliance, together with a plat and field notes of the claim or claims in common, made by or under the direction of the United States surveyor-general, showing accurately the boundaries of the claim or claims, which shall be distinctly marked by monuments on the ground, and shall post a copy of such plat, together with a notice of such applicatiou for a patent, in a conspicuous place on the land embraced in such plat previous to the filing of the application for a patent, and shall file an affidavit of at least one person that such plat and notice have been duly posted, and shall also file a copy of the notice in such land office, and shall thereupon be entitled to a patent for the land in the manner following: The register of the land office, upon the filing of such application, plat, field notes, notices, and affidavits, shall publish a notice that such application has been made, for the period of sixty days, in a newspaper to be by him designated as published nearest to such claim; and he shall also post such notice in his office for the same period. The claimant at the time of filing this application, or at any time thereafter within the sixty days of publication, shall file with the register a certificate of the United States surveyor-general that five hundred dollars' worth of labor has been expended or improvements made upon the claim by himself or grantors; that the plat is correct, with such further description by such reference to natural objects or permanent monuments as shall identify the claim, and furnish an accurate description, to be incorporated in the patent. At the expiration of the sixty days of publication the claimant shall file his affidavit, showing that the plat and notice have been posted in a conspicuous place on the claim during such period of publication. If no adverse claim shall have been filed with the register and receiver of the proper land office at the expiration of the sixty days' publication, it shall be assumed that the applicaut is entitled to a patent, and that no adverse claim exists, and upon the payment to the proper officer of five dollars per acre he shall receive a certificate of entry; and thereafter no objection from third parties to the issuance of a patent shall be heard except it be shown that the applicant has failed to comply with the terms of this chapter. But no more than three thousand feet in length along the vein on claims located prior to the tenth day of May, eighteen hundred and seventy-two, and not more than the extent of fifteen hundred feet in length by six hundred feet in width located after said date shall be included in the same application for a patent, and not more than forty acres of placer or petroleum ground shall be included in the same application for a patent: *Provided*, That when fractional claims are located or sought to be patented between other existing claims the end lines may be made to conform to the lines of such adjoining claims."

SEC. 3. That section twenty-three hundred and thirty-four of the Revised Statutes be amended by adding thereto the following:

"And the surveyors appointed under the provisions of this section shall have power to administer oatbs to their assistants."

SEC. 4. That section twenty-three hundred and thirty-five of the Revised Statutes be amended so as to read:

"SEC. 2335. All affidavits required to be made under this chapter may be verified before any officer authorized to administer oaths in any State or Territory of the United States or in the District of Columbia having an official seal, and all testimony and proofs may be taken before any such officer, and when duly certified by the officer taking the same, attested by his seal of office, shall have the same force and effect as if taken before the register and receiver of the Land Office. In cases of contest as to the mineral or agricultural character of land the testimony and proofs may be taken, under such regulations and notice as the Commissioner of the General Land Office may prescribe: *Provided*, That the presence of rock in place bearing gold, silver, cinnabar, petroleum or other valuable mineral shall be regarded as prima facie evidence that the land containing the same is mineral in character: *And provided further*, That in investigating the character of land with a view to ascertain whether it is more valuable for mineral OR *than* agriculture, evidence may be taken of the mineral discovered or developed adjacent to such land."

SEC. 5. That section twenty-three hundred and thirty-seven of the Revised Statutes be amended so as to read:

"SEC. 2337. Where nonmineral land not included in a lode claim is used or occupied, or is intended in good faith to be used or occupied by the proprietor of such vein or lode claim for mining or milling purposes, such uonmineral surface ground may be embraced and included in an application for a patent for su h vein or lode claim, and the same may be patented therewith or separately, subject to the same preliminary requirements as to survey and notice as are applicable to veiu or lode claims; but no location hereafter made of such nonmineral land shall exceed ten acres, and payment for the same must be made at the same rate as fixed by this chapter for the superficies of the lode claim. The owner of a quartz mill or reduction works, not owning a mine in connection therewith, may also receive a patent for his mill site, as provided in this section."

SEC. 6. Amend section twenty-three hundred and thirty-eight of the Revised Statutes so as to read:

"SEC. 2338. As a condition of sale each patent shall reserve the right of way through or over any mining claims for roads, ditches, canals, cuts, tunnels, and other easements, for the purpose of working mines and for agricultural purposes: *Provided*, That any damages occasioned thereby shall be assessed and paid in the manner provided by the laws of the State or Territory in which such mine is situated for assessments and payments for land taken for public use under the right of eminent domain. And the rights and easements heretofore reserved under the provisions of this section (twenty-three hundred and thirty-eight of the Revised Statutes) in patents heretofore issued shall be regulated and made available as herein prescribed."

SEC. 7. That town-site entries may be made by iucorporated towns and cities on the mineral lands of the United States, but no title shall be acquired by such towns or cities to any vein of gold, silver, cinnabar, copper, or lead, or to any valid mining claim or possession held under existing law. When mineral veins are possessed within the limits of an incorporated town or city, and such possession is recognized by local authority or by the laws of the United States, the title to town lots shall be subject to such recognized possession and the necessary use thereof, and when entry has been made or patent issued for such town sites to such incorporated town or city, the possessor of such mineral vein may enter and receive patent for such mineral vein and surface grouud recognized hy the local laws and statutes of the United States not held or possessed adversely to the claimant for such miueral vein by other than the said city or town, or when it shall appear that the claimant otherwise entitled to such mineral vein has acquired title to such surface ground from the said city or town: *Provided*, That no entry shall he made hy such mineral-vein claimant for surface grouud where the owner or occupier of the surface grouud shall have had possession of the same before the inception of the title of the mineral-vein applicant.

SHASTA reports that the Distlehorst Bros. are making "barrels" of money with their dredger, which is now working the river bed opposite Middle Creek station. They work night and day, and are getting valuable returns.

Copy of Bill Introduced in Congress by Hon. Francis G. Newlands of Nevada.

Introduced February 17, 1894, and referred to Committee on Mines and Mining.

The bill proposes to amend Sections 2324, 2334, 2335 and 2337 of the Revised Statutes of the United States by striking out the portions in *italics* and inserting the portions in SMALL CAPS.

A BILL

To amend chapter six, of title thirty-two, of the Revised Statutes relating to Mineral Lands and Mining Resources.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled:

SECTION I. That section twenty-three hundred and twenty-four or the Revised Statutes be amended so as to read:

"SEC. 2324. The miners of each mining district may make regulations not in conflict with the laws of the United States, or with the laws of the State or Territory in which the district is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground BY POSTS OR MONUMENTS so that its boundaries can be readily traced. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location, and such a description of the claim or claims located by reference to some natural object or permanent monument as will identify the claim. On each claim located after the tenth day of May, eighteen hundred and seventy-two, and until *a patent* PAYMENT OF THE PURCHASE MONEY AND A CERTIFICATE OF ENTRY has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year. On all claims located prior to the tenth day of May, eighteen hundred and seventy-two, ten dollars' worth of labor shall be performed or improvements made *by the tenth day of June, eighteen hundred and seventy-four and* DURING each year *thereafter* for each one hundred feet in length along the vein until *a patent* PAYMENT OF THE PURCHASE MONEY AND A CERTIFICATE OF ENTRY has been issued therefor; but where such claims are held in common, such expenditure may be made upon any one claim; *Provided that the period within which the work required to be done annually on all unpatented mineral claims shall commence on the first day of January succeeding the date of the location of such claim, and this section shall apply to all claims located since the tenth day of May, anno domini, eighteen hundred and seventy-two.* THAT THE PERIOD WITHIN WHICH THE WORK REQUIRED TO BE DONE ANNUALLY ON MINERAL CLAIMS SHALL COMMENCE AT TWELVE O'CLOCK, MERIDIAN, ON THE FIRST DAY OF JANUARY SUCCEEDING THE DATE OF LOCATION OF SUCH CLAIM. WHEN THE LABOR REQUIRED BY THIS ACT SHALL HAVE BEEN PERFORMED, OR THE IMPROVEMENTS MADE, AN AFFIDAVIT MAY BE FILED WITHIN THIRTY DAYS AFTER THE TIME LIMITED FOR THE PERFORMANCE OF SUCH LABOR, OR MAKING SUCH IMPROVEMENTS, WITH THE RECORDER OF DEEDS OF THE COUNTY IN WHICH THE CLAIM OR MINE IS SITUATED, PARTICULARLY DESCRIBING THE LABOR PERFORMED AND THE IMPROVEMENTS MADE, AND THE VALUE THEREOF, WHICH AFFIDAVIT SHALL BE PRIMA FACIE EVIDENCE OF THE FACTS THEREIN STATED; and upon a failure to comply with *these conditions*, THE CONDITIONS OF THIS ACT IN THE PERFORMANCE OF LABOR OR THE MAKING OF IMPROVEMENTS, the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location of the same had ever been made: Provided, that the original locators, their heirs, assigns or legal representatives, *have not resumed*, DO NOT RESUME work upon the claim after SUCH failure and before such RE-location AND CONTINUE THE SAME WITH REASONABLE DILIGENCE UNTIL THE REQUIRED AMOUNT OF LABOR SHALL HAVE BEEN PERFORMED OR IMPROVEMENTS MADE.

"Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required hereby the co-owners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent co-owner personal notice in writing, or notice by publication in the newspaper published nearest the claim for at least once a week for ninety days; and if at the expiration of ninety days after such notice in writing, or by publication, such delinquent shall fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditure. A COPY OF SUCH NOTICE, TOGETHER WITH AN AFFIDAVIT SHOWING PERSONAL SERVICE OR PUBLICATION, AS THE CASE MAY BE, OF SUCH NOTICE WHEN FILED AND RECORDED WITH THE RECORDER OF DEEDS OF THE COUNTY IN WHICH SUCH MINING CLAIM IS SITUATED, SHALL BE EVIDENCE OF THE ACQUISITION OF TITLE OF SUCH CO-OWNERS.

"Where a person or company has or may run a tunnel for the purpose of developing a *lode or lodes*, CLAIM OR CLAIMS owned by said person or company, the money so expended in RUNNING said tunnel shall be taken and considered as expended on said *lode or lodes, whether located prior to or since the passage of said act; and such person or company shall not be required to perform work on the surface of said lode or lodes in order to hold the same as required by said act*, CLAIM OR CLAIMS: PROVIDED FURTHER, THAT SAID CLAIM OR CLAIMS SHALL BE DISTINCTLY MARKED ON THE SURFACE AS PROVIDED IN THIS ACT."

SEC. 2. That section twenty-three hundred and thirty-four of the Revised Statutes be amended by adding thereto the following:

"AND THE SURVEYORS APPOINTED UNDER THE PROVISIONS OF THIS SECTION SHALL HAVE POWER TO ADMINISTER OATHS TO THEIR ASSISTANTS."

SEC. 3. That section twenty-three hundred and thirty-five of the Revised Statutes be amended so as to read:

"SEC. 2335. All affidavits required to be made under this chapter may be verified before any officer authorized to administer oaths *within the land district* IN THE STATE OR TERRITORY where the claims may be situated, HAVING AN OFFICIAL SEAL, and all testimony and proofs may be takeu before any such officer, and, when duly certified by the officer taking the same, ATTESTED BY HIS SEAL OF OFFICE, shall have the same force and effect as if taken before the register and receiver of the land office.

"In cases of contest as to the mineral or agricultural character of land, the testimony and proofs may he taken as herein provided, on personal notice of at least ten days to the opposing party; or, if such party cannot be found, then by publication for at least once a week for thirty days in a newspaper to be designated by the register of the land office as published nearest to the location of such land; and the register shall require proof that such notice has been given: PROVIDED, THAT THE PRESENCE OF ROCK IN PLACE BEARING GOLD, SILVER, CINNABAR, PETROLEUM, OR OTHER VALUABLE MINERAL, SHALL BE REGARDED AS PRESUMPTIVE EVIDENCE THAT THE LAND CONTAINING THE SAME IS, AND ALWAYS HAS BEEN, MINERAL IN CHARACTER: AND PROVIDED FURTHER, THAT IN INVESTIGATING THE CHARACTER OF LAND WITH A VIEW TO ASCERTAIN WHETHER IT IS MORE VALUABLE FOR MINERAL THAN AGRICULTURAL, EVIDENCE MAY BE TAKEN OF THE MINERAL DISCOVERED OR DEVELOPED ADJACENT TO SUCH LAND, PROOF OF WHICH SHALL BE PRESUMPTIVE EVIDENCE THAT THE LAND IN QUESTION IS, AND ALWAYS HAS BEEN, MINERAL IN CHARACTER: AND PROVIDED FURTHER: THAT WHEREVER LAND IS PROVEN TO BE WITHIN A WELL-DEFINED MINERAL BELT SUCH LAND SHALL BE DEEMED, PRESUMED AND TAKEN TO BE, AND ALWAYS TO HAVE BEEN, MINERAL LAND, UNLESS THE CONTRARY IS PROVEN: AND PROVIDED FURTHER, THAT THE PROVISIONS OF THIS CHAPTER SHALL

BE LIBERALLY CONSTRUED WITH A VIEW TO AID THE APPLICANT IN PROCURING TITLE TO THE MINERAL LANDS OF THE UNITED STATES, AND THAT THE RULES AND REGULATIONS PRESCRIBED BY THE LAND DEPARTMENT FOR ITS GOVERNMENT AND THAT OF ITS OFFICERS, IN DISPOSING OF SAID LANDS, SHALL BE SO FORMULATED AND ADMINISTERED AS TO ASSIST THE GOVERNMENT IN DISPOSING OF SAID LANDS TO BONA FIDE APPLICANTS, AND NOT SO AS TO IMPEDE THE SALE THEREOF, OR IMPOSE ONEROUS BURDENS UPON APPLICANTS."

SEC. 4. That section twenty-three hundred and thirty-seven of the Revised Statutes be amended so as to read:

"SEC. 2337. Where non-mineral land, not *contiguous to the vein or lode* INCLUDED IN A LODE CLAIM, is used or occupied, OR IS INTENDED TO BE USED OR OCCUPIED by the proprietor of such vein or lode CLAIM for mining or milling purposes, such *non-adjacent* NON-MINERAL surface ground may be embraced and included in an application for a patent for such vein or lode CLAIM, and the same may be patented therewith, OR SEPARATELY, subject to the same preliminary requirements as to survey and notice as are applicable to *veins or lodes*, VEIN OR LODE CLAIMS; but no location hereafter made of such *non-adjacent* NON-MINERAL land shall exceed *five* TEN acres, and payment for the same must be made at the same rate as fixed by this chapter for the superfices of the lode CLAIM. The owner of a quartz mill or reduction works, not owning a mine, in connection therewith, may also receive a patent for his mill-site as provided in this chapter."

Personal.

CHIEF ENGINEER PETERSON of the W. Y. O. D. mine, Grass Valley, has resigned his position.

MR. BOSQUI succeeds C. W. Merrill in charge of the Bodie Standard Co.'s cyanide plant.

THOS. W. BUZZO succeeds W. E. Hall as superintendent of the Alice G. & S. M. Co., at Walkerville, Utah.

JOHN W. YOUNG, who formerly represented Fraser & Chalmers at Helena and Spokane, is now general western agent of the company, with headquarters at Salt Lake City.

PETER APPLEGATE has recently been appointed Government Mineral Surveyor for southern Oregon. His work will be that of surveying and examining all mining property in this part of the State for which a patent is asked from the Government.

Obituary.

ERNEST HUHN, superintendent of the Eagle Bird or Oak Tree mine, at Mayhert, Nevada Co., Cal., met a terrible death on the 8th inst., falling down the shaft a distance of 600 feet while superintending the rebuilding of the hoisting works. He was a well-known mining man, a graduate of Freiberg, at one time a member of the firm of Huhn & Luckhardt here, and intimately connected with various mining projects of considerable magnitude. Mr. Huhn was in the fifty-sixth year of his age.

IT has been decided to continue the Ontario (Utah) drain tunnel from the No. 2 shaft to a point underneath No. 3, and operations will be commenced at once. Whether the tunnel will be continued to the Daly or not is a question that will be decided after the present objective point is reached.

Concentrates.

BUTTE, Montana, is the largest mining camp on earth.

IT is proposed to establish a provincial mining bureau in Vancouver, Wash.

AT Greaterville, Arizona, 150 men are placering for gold, most of them Mexicans.

A SIXTY-STAMP mill is being erected at the Little Jessie group, Chaparral, Arizona.

THE Eric mine near Eureka South, Nevada Co., is to be extensively operated this winter.

ANOTHER dividend has been declared by the Morning Star Mining Company of $3 per share.

THOUGH no new mills are just now being started in Utah, good development work is being done all over the territory.

THE Boston & Montana Copper and Silver Mining Company has declared dividend No. 16 of $1 per share, payable the 27th.

NATIVE quicksilver is reported found at Tuscarora, Nev., assaying from fifteen per cent to as high as thirty-five per cent.

MESSRS. BROWN & HEIMRICH of the Mercur Co., Utah, have been experting a gold property in Siskiyou Co. with a view to investment.

ABOUT forty men are placer mining at Rock creek, South Okanogan, most of whom will stay in all winter. The average is $6 per day.

JOHN J. NEATHAMMER'S placer mines in Saxes Creek district, Oregon, have been sold to Messrs. Johnson and Noland of Seattle for $15,000.

THE Economy Reduction Works at Florence, Col., offer to handle refractory gold ore for $7 per ton. The plant includes both chlorination and cyanide.

THE Badger mine on Pike Flat, Nevada county, is to be bonded to A. Carrigan and other San Francisco merchants for two years, for further development.

MONTREAL MEN have bought the Victoria Hydraulic Co.'s claims on the north and south forks of the Quesnelle, B. C., for $70,000. Ross Brown is now at work on the property.

THE Maud Hydraulic Mining Company has been incorporated by Messrs. J. M. Browning, J. M. Buxton and C. Wilson, of Vancouver, B. C. The capital stock is $25,000.

ABOUT twelve mining claims believed to be in British Columbia have been found to be on the Colville reservation. Over $1000 has been spent in labor and now titles cannot be secured.

THE Tucson, Arizona, *Citizen* says the Old Glory camp is proving to be a great success. The mine and mill are in full operation and giving satisfaction. A few days ago a letter from S. H. Gould, superintendent of the mill, said that the test run had been made and a large amount of gold saved on the plates.

IT is reported in southern Oregon that Neal and another man, who own the Golden Eagle mine on Williams creek, took out a $10,000 bunch of ore one day last week. The mine had been bonded to Ashland men for several months, but they had allowed the bond to lapse after doing much work. The owners had worked but a day or two when they made the strike.

THE mines in that part of the Black Hills around Garden City are coming to the front and prospecting is going on very busily. The rich discoveries in the Katie lode of the South Dakota Mining Company have encouraged lots of depressed prospectors to resume their search for the precious metals known to exist there in large quantities.

SINCE the Morning mine, at Mullan, Idaho, started in on the co-operative plan several more mines in that vicinity are spoken of as probable startors during the month. The eighty-five men employed at the Morning seem to be perfectly satisfied with the new order of things, and many applicants are refused employment, though it was thought at the beginning that not many miners would apply for jobs at the Morning under the co-operative arrangement.

"NON-ASSESSABLE treasury stock" in a Cripple Creek, Col., gold mine is offered at ten cents a share to the publishers of this paper to be swapped for advertising space. The proffer states "we are positive you will make a handsome profit." It may be said without prejudice that it is not customary for owners of stock in a gold mine, who are positive that "a handsome profit" will be realized therefrom, to make such an offer. Though it is declined, the present owners of the stock are to be congratulated on their valuable possession.

IT is calculated that $10,000,000 has been saved to the owners of mining claims by the suspension of the law requiring $100 in labor to be annually spent on unpatented claims. It may be objected that the check to the expenditure of money works damage to districts where the circulating medium is not any too plentiful, but on the whole the suspension of the statute has been of benefit to the prospector. It does not prevent any one who wants to from performing the prescribed amount of work on a claim, and has lightened many a poor miner's load.

AT Midway, B. C., last week was a case before Gold Commissioner Lambly. A man named Haas had staked a claim, but did not record it. A man named Baxter staked it again, but he also did not record it. The plaintiff, Dittmer, and Haas, the defendant, again located claims, overlapping the original, and these were recorded. It was held that Haas' rights were void because he had not obtained permission to record the second time, and Dittmer's location was good. Haas could, however, upon obtaining the required permission, stake the part not taken by Dittmer.

Makes Everybody Tired.

George Ohleyer has again rushed into print, and occupies two columns in the *Appeal* on "The Hydraulic Giant—The Havoc It Causes—Desolation in Valleys," etc., etc. Every time things quiet down between the miners and the farmers Ohleyer gets a long stick and stirs them up again. George, you make everybody tired. Go and take a rest.—Oroville Mercury.

JOSHUA HENDY MACHINE WORKS,

(INCORPORATED SEPTEMBER 20, 1882.)

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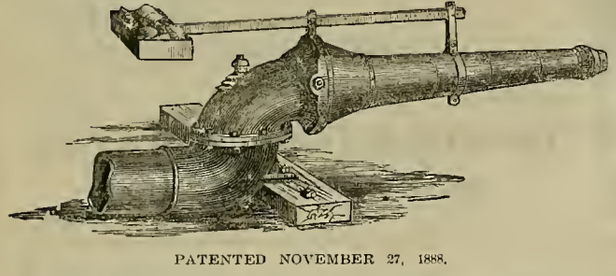

PATENTED NOVEMBER 27, 1888.

Improved Form Double Jointed Hydraulic Giant.

Manufacturers of

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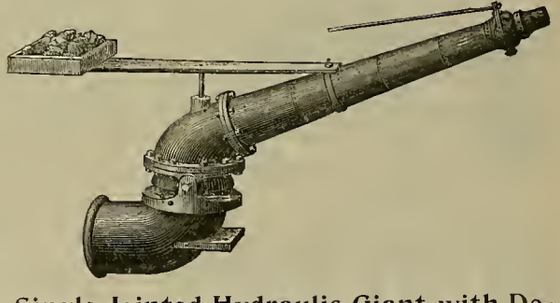
HYDRAULIC MINING MACHINERY,

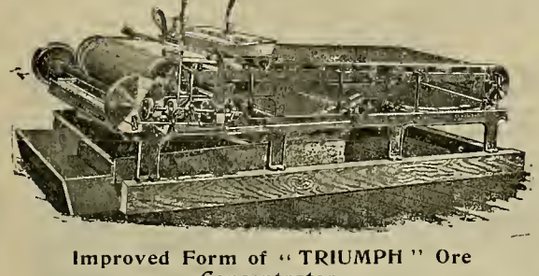
SAW MILLING MACHINERY,

HYDRAULIC GRAVEL ELEVATORS,



Single Jointed Hydraulic Giant with Deflector and Weighting Attachment.

HYDRAULIC GIANTS, SINGLE AND DOUBLE JOINTED IMPROVED FORM.



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SHEET IRON HYDRAULIC PIPE, ALL SIZES, AND GATE VALVES FOR SAME.

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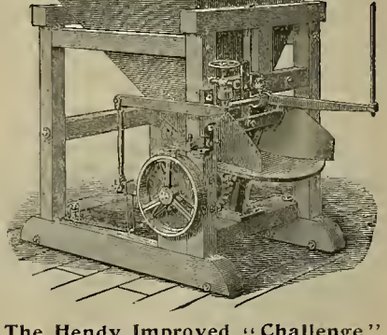
NON-SHRINKING PATENT WOODEN TANKS,
REEVES' WOOD SPLIT PULLEYS,
STEAM PUMPS,
GRIFFIN CHILLED CAR WHEELS, ETC., ETC.



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Scientific Progress.

Acclimatized Rats and Cats.

A new interesting case of the gradual adaptation of animals to their surroundings is quoted in a recent number of *Public Opinion* from the Pittsburg *Dispatch*. It appears that in the cold-storage warehouses in Pittsburg there were originally no rats or mice. The temperature iu the cold rooms was too low. Tbe keepers soon fouud, however, tbat the rat is an animal of remarkable adaptability. After some of these houses had been in operation for a few months, the attendants found that rats were at work in the rooms where the temperature was constantly kept below the freezing point. They were found to be clothed in wonderfully long and thick fur, even their taperiug snake-like tails being covered by a thick growth of bair. Rats whose coats have adapted themselves to the conditions under which they live have domesticated in all the storage warehouses in Pittsburg. The prevalence of rats in these places led to the introductiou of cats. Now, it is well known that pussy is a lover of warmth and and comfort. Cats, too, have a great adaptability to conditions. When cats were turned loose in the cold rooms tbey pined and died because of the excessive cold. One cat was finally introduced into tbe rooms of tbe Pennsylvania Storage Company which was able to witbstand the low temperature. She was a cat of unusually thick fur, and she tbrived and grew fat in quarters wbere the temperature was below thirty degrees. By careful nursing a brood of seven kittens was developed in the warehouse into sturdy, thick-furred cats that love an Icelandic clime. They have been distributed among the other cold-storage houses of Pittsburg, and have created a peculiar breed of cats, adapted to the conditions under which they must exist to find their prey. These cats are short-tailed, chubby pussies, with hair as thick and full of under fur as the wild cats of the Canadian woods. One of the remarkable things about them is the development of their "feelers." These long stiff bairs that protrude from a cat's uose and eyebrows are, in tbe ordinary domestic feline, about three inches long. In the cats cultivated in tbe cold warehouse the feelers grow to a lengtb of five and six inches. This is probably because the light is dim in these places, and all movements must be tbe result of the feeling sense. The storage people say that if one of these furry cats is taken into the open air, particularly during the hot season, it will die in a few hours. It cannot endure a high temperature, and an introduction to a stove would send it into fits.

Small-pox.

The recent outbreak of small-pox in London, though the prompt measures taken seem to have been effectual in confining it within moderate limits, may serve to remind us how difficult a thing it is to fight against an enemy whose exact nature we do not know. Empirically, we have learned much as to the prophylaxis and treatment of the disease, and now that experiment has demonstrated that vaccinia is merely small-pox modified by transmissiou through the cow, we have a rational scientific basis for the practice of vaccination. Yet, though small-pox is always with us, and in spite of the fact that experimental inoculation of mankind with its attenuated virus is rendered compulsory by law, the actual nature of the virus remains still under dispute. It is rather the fashion nowadays, when no bacterium can be demonstrated in a given specific disease, to invoke the Protozoon. That Protozoa may cause disease we know—witness malaria—but the utmost caution is required in interpreting the appearances to be seen in epithelial cells stained with fancy dyes, and the protozoan origin of small-pox, as of cancer, rests at present on a very slender foundation. And, indeed, there is now some evidence that the virus of small-pox may after all be a spore-bearing bacillus which bas hitherto eluded observation by its habit of turning into an unstaiuable spore at an earlier period thau tbat at wbich any one had tbougbt of looking for it. Both Dr. Klein and subsequently Dr. S. Monckton Copeman have independently discovered tbat such a spore-bearing bacillus is to be demonstrated in the lesions of small-pox and vaccinia, if search be made at a sufficiently early stage of the disease; and tbougb cultivatious have uniformly failed, there seems at least to be a possibility that this organism may prove to be the true cause of small-pox.—Natural Science.

Measuring Time Intervals.

The measurement of minute intervals of time is one of the most difficult subjects met with in the laboratory, and this is more especially the case as the apparatus employed is often little adapted for the use of those who lack experience in the precisiou gained by years of experimental work in physics. Mons. Tissandier has recently devised a photochronograph, which comprises a metallic disc turning freely on an axis passing througb its center. The free end of a spring carries a needle-point, which bears against the disc; this spriug is timed to give 500 vibrations per second. This rate is determined by timing the spring so that it vibrates between known vibrations of 493 and 522 periods per second. Any want of extreme accuracy in the determination of the intermediate point is not of great importance, as it can be shown that the difference only affects the fifth place of decimals of a single second. Of course any variation in speed of the disc does not influence the number of vibrations of the spring. By means of a magnesium light traces of the path of the spring are left upon a sensitive plate mounted upou the disc. The apparatus is certainly not new in principle in this country, but the arrangement is one which we are not aware has been described in the form given to it by Mons. Tissandier.—Industries and Iron.

Opal Mines Deserted.

The Nampa, Idaho, *Leader* says: Reports from the Owyhee opal fields are anything but encouraging. Not a man left in camp, and the visitor may enter mines and carry away what he finds. What a pity it is indeed that these stones cannot be marketed, for it is an undisputed fact that they surpass anything iu tbe world. The famous Shirley mine, from which the opals that took first prize at the World's Fair were taken, has also been deserted, and although the mountain contains gems enough to supply the world—and of the rarest beauty, too—has not as much as a "keep out" uotice posted up to waru off the inquisitive prospector. Only a short year ago there were probably a hundred men in camp, and many of them possessed a can full of these beautiful stones that would have dazzled the eyes of a native from the great opal fields of Central America, and whicb had a commercial value of from $3 to $35 per karat, yet no buyers could be found, and now these men are working rockers on Snake river, barely making a living. It is to be hoped that there will yet be a demand for Owyhee opals and tbe fondest hopes of those who own tbe claims may be fully realized.

Leadville's Gold Belt.

"It should be remembered," said one of the best known miners of the camp in an interview with the *Herald-Democrat*, "that as yet the gold belt is not the seat of great mineral production. With the exception of the Ibex, the Lillian and the Golden Eagle, tbere are not any important gold-producers. It will take time and mouey for those other shafts to get down to tbe ore bodies, but I am perfectly well satisfied that they will catch these great Breece Hill chutes. By next spring I am under the impression that tbere will be no less tban a dozen large shippers of gold ore from Breece and Printer Boy Hills."

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Place of meeting will be publisbed later.

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Mechanical Progress.

The Machinist in the Foundry.

An engineer who devotes his attention mainly to and is especially interested in machines for use in foundries, says the *American Machinist*, was remarking the other day that he knew of a case where an establishment making large numbers of steam-pipe elbows had built a special machine at a cost of about $4000 for tapping these elbows, the saving effected by the machine as compared with their older methods being only a few cents on the hundred elbows; yet it was all they expected, and was enough to warrant the expense of the machine.

The manager of the same establishment was shown, conclusively, that by the adoption of a certain molding machine for making these same elbows the cost of their production could be reduced, as compared with his present methods, considerably more than fifty per cent. The machine was not ordered, and our friend looks upon this as a typical illustration of the peculiar difficulties which lie in the path of the man who attempts to do missionary work in the foundry. Here was a concern willing to make close figures on the possible saving by the use of a machine to be set up and used in their machine shop, and to be guided by the results shown by the figures, even though the margin was very small; yet when the same concern came to consider a machine of much greater economic potentiality for their foundry, figures showing a very large margin failed to impress them sufficiently to influence their decision in favor of the machine.

This and many other similar instances are probably due mainly to the fact that successful manufacturers have been educated up to the point of taking ever possible advantage, and introducing every possible improvement in machine shop and kindred operations, while in the foundry they have so long been accustomed to letting things go in the old way that the mere introduction and use of an improved machine or method that, were it in the machine shop, would be taken as a matter of course, is here looked upon as revolutionary, and, in fact, so much of a departure from the beaten path as to make it seem like a leap in the dark.

No douht the fact that improved machines which are to he used in machine shops will he under the care of, if not operated by, machinists skilled in such matters and interested in their success, while in the foundry it is usually different, undouhtedly has much to do with the matter, and in many instances this feature of the case is of considerahle importance.

Nevertheless, uothing seems more eertain than that the foundry work is to he greatly improved within the next few years, and in no way more than hy the increased use of machinery for doing that large proportion of work which is scarcely more than a repetition of the same cycles of movements and operations from morning until night, and from Monday until Saturday—work which any intelligent man can quickly learn to do, and which no molder, worthy of the name, ought willingly to work at.

It is almost needless to point out that the manufacturer whose foundry work is adapted to it and who admits the machinist and his methods into the foundry first, and hefore it becomes the universal practice, will reap the largest rewards of his enterprise, and if he wants to be fully abreast of the procession he will be very cautious ahout concluding for himself what is and what is not suitahle work to be done upon machines. Rapid advances are heiug made along this line, and unless a foundryman has fully investigated the matter, and is sure ahout it, he had hetter look into it. There are some difficulties in the way, perhaps, but so there are in the way of ahout everything that is at all worth doing, and what is work, after all, hut simply a continual overcoming of difficulties of one sort or another. The machinist has invaded the foundry and will remain there, not to do the work which requires the skilled and highly trained molder—work which requires the exercise of the real art of the molder—hut to do all that large elass of work which is small enough and made in sufficiently large numhers to make it worth while to put in and operate machines.

The Gas Engine.

The probabilities are, says the *Scientific Machinist*, that the next ten years will witness the development and use of gas engines to an extent little dreamed of by the average person. The small steam engine is likely to feel this competition severely in the immediate future. The uses of small power in cities are great and rapidly growing. It was believed hy many a few years ago that the electric motor would be substituted for small gas engines in cities and towns, but that has not been done extensively. The expense of current is greater than the public expected it to be, and the liahility of its being cut off hy reason of break-downs at the power station, which experience has proved to be of no small consideration, has not caused electric power to grow in favor. Perhaps the shutdowns for repairs to the machinery or the line, the latter particularly, as it is exposed to many risks, fire being the most annoying, are not more numerous or otherwise damaging than those which occur in the small independent plant, hut it is a peculiarity of human nature to experience less exasperation with trouhle from a domestic than from an outside source. Another inconvenience of the motor is that it cannot he used even a little after the hour for current to he shut off without nearly douhle the expense. One may require power hut an hour or two during the day, hut with a motor the expense is no less than it would he were it used all day.

Were it not for the city ordinances requiring a licensed operator for every steam engine plant, large or small, the motor would have made even less progress than it has.

Nearly all these ohjections are overcome hy the engine which can he operated with gas from the city retorts or made from gasoline on the spot. It can he used at any time. When not in use it is not an expense. It requires no licensed operator.

Not only does the vapor engine promise to supplant the motor and small engine and hoiler plants for stationary work, hut it is reasonahly certain to hecome a sharp competitor of the former in street railway service in the near future. The trolley system cannot, we believe, hold its present commanding place in railway work many years. It has served and is serving the puhlic satisfactorily, hut it has many serious faults, chief among which is the dependence of the whole line on a single plant. Sooner or later each car must he equipped with an independent power generator. Of all motors capable of use on cars, independently, the gas engine is the hest adapted to the work. It has its faults, and there are a numher of obstacles to he successfully overcome hefore it will come into general use for street-car propulsion, hut the extension of its use in other work and the facility with which engineering difficulties limiting its use have heen surmounted, lead us to helieve that it will soon reach the necessary stage of perfection for railway service to cause it to be extensively employed for that work.

Peculiar Locomotives.

The Baldwin Locomotive Works have just turned out three locomotives for the Erie & Wyoming Valley Railroad, which have some peculiar features. They are moguls, with fifty-six-inch drivers, wide fire-box (not Wooten) and weigh ahout 120,000 pounds. The peculiar features are the three 17x24-inch cylinders, set on an incline, so as to allow the middle one to drive the main axle just inside the right driver, all heing connected at 120°, so as to have a continuous pull, deemed necessary by the master mechanic, Mr. John B. Smith of Dunmore, Penn., on account of the heavy grades on the road. The tank is also peculiar to American roads, and is the same as that adopted hy Daniel Coxe Jr. of the D. S. & S. R. R., heing a six-wheel tank similar to English practice.

Burning Coal Dust.

An apparatus for hurning coal dust has been invented and hrought out in Germany, which appears worthy of more than passing notice. It is stated that the consumption of even the most inferior class of coal-dust is attended with no smoke, while the heat produced is so intense that the apparatus has heen adapted in Berlin to smeltiug works, and with excellent results. The gases as analyzed contain 9.8 per cent carbonic acid, 1 per cent air, 79 2 per cent nitrogen.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

AROUND FORBESTOWN. — *Register*: From County Surveyor McCoy who was at work in the Forbestown region last week we gather the following mining items:

He surveyed two quartz mines for the Beik brothers. These ledges lie east of the placer mine of J. B. Price and his mine lies east of hut adjoins the Stow or Gold Bank mine. While there he surveyed for a new high flume to he erected hy the South Feather Ditch Company as they have to put up a new flume fifty feet or more in height across a canyon. The superintendent of the company is actively at work repairing aud building new flumes and putting the ditches in the best possible order. H. P. Stow is in 125 feet with his big tunnel which is to tap the Gold Bank quartz lode eleven hundred feet below the present works. The tunnel will be twelve hundred feet long and is heing driven with Burleigh drills run by water power. When the ledge is tapped they will then drive up the 1100 feet and thus have an immense body of ore open for work. If all proves satisfactory a huge mill will be built down in the canyon. A new road costing between $4,000 and $5,000 is now being constructed by Mr. Stow from his present mill down to the mouth of the big tunnel.

The Titus, Vail and Finch quartz mine on the north side of the South Fork is looking very well and so is the new ledge discovered by G. W. Price.

About ninety-five men are employed at the Stow mine, mill, tunnel and road, while from fifteen to twenty men are at work in the Shakespeare mine. The lot of rock crushed by the Sheaspeare mill from the Carlisle mine proved rich enough to warrant tbe erection of a mill on the property and it is understood that Mr. Carlisle is now in San Francisco making arrangements about a mill to he built.

The Mt. Hope mill three miles above Frobestown is running. Work on the Phœnix at Hurleton has stopped until spriug. It is said that Russell & Company the owners of the Dutch Ravine mine will huild a five stamp mill.

The Hurleton King owned hy McMillan Brothers is heing opened hy them and promises well.

Nevada.

Transcript: The Banded Treasure mine, situated on the Middle Yuba river, a few miles from North San Juan, is looking fine. A three-foot Huntington mill has just heen put up. The ledge is large; the quartz assays $50 a ton. Being of a decomposed nature, it is easily and quickly crushed hy a rotary mill.

ON THE SAN JUAN RIDGE.—Cor. Nevada *Transcript:* The Enterprise is situated about 800 feet west of the Delhi, six miles from Columhia Hill. Development work is being done at this mine. The St. Gothard mine, which is owned principally hy the Champion Mining Company of this city, is also located here. There is not much doing on this mine at the present time and very few men are employed. The Live Oak miue is located ahout six miles from Columbia Hill on the same side of the river as the Delhi. The tunnel has heen driven a distance of 500 feet and some valuable ore discovered. A. McMahon, Jr., who is the superintendent of the mine, informed us that the prospects of the mine were exceedingly bright. The ledge is eighteen inches thick and has an average value of $10 per ton. While Columhia Hill is not so prosperous as at some periods of her history, the outlook is far from discouraging.

CHEROKEE.—From Columhia Hill we proceeded to Cherokee and found everything quiet, owing to the suppression of hydraulic mining. There are some quartz ledges being developed in the surrounding country, prominent among which is the Quick Bros.' property at Badger Hill. This mine is in a prosperous condition. The ore is of a very high grade. The sulphurets will average $120 a ton. The Superintendent, Paul Quick, Jr., informed us that the vein is fifteen inches thick and every part of it shows free gold. This mine is employing several meu and there is every evidence of its hecoming a permanent droperty.

SAN JUAN.—San Juan is rapidly recovering from the shock received through the suppression of hydraulic mining. The people are confident of the future happiness and prosperity of the town and they hear a cheerful expression. The people are aware of the great injustice which they have suffered through the inhibition of hydraulic mining, hut they bear their grievances with a nohle and heroic patience which must eventually win for them the sympathy and support of every individual who understands their position.

San Juan was once the center of a large and prosperous mining community. On every hand were evidences of activity and success, which must have heen gratifying to every resident. In close proximity to the town is the famous Sebastopol miue, which has heen great in extent and the richness of its gravel. This mine has produced several millions of dollars, and when in full operation gave employment to a large number of men. At the present time several quartz veins are being developed which, if successful, will prove a valuahle adjunct to the town. Prominent among the quartz mines in close proximity to San Juan are the Boss mine, Penetrator and the Crane and Wright. The mines are all located on the same ledge and are yet in a state of development. The Boss mine is owned by Morris and company of San Francisco. They are employing fifteen men and extracting a large amount of ore monthly.

The future of the mine is promising. There is a large vein and the ore is easily extracted. The Crane and Wright is owned by the gentlemen whose names it bears. They have succeeded in developing a fine body of mineral. A tunnel is driven into the hill for eighty feet and a ledge averaging from five to sixty-five is in sight. They already have about five hundred tons of ore extracted, which is valued at $6 per ton. They have five hundred feet of backs ready for stoping. The proprietors informed the writer that a mill could he constructed cheaply and that water power is easy of access. With a fair amount of capital a veritable bonanza could be developed on such a magnificent hody of mineral. The Penetrator is owned hy the Huckins brothers of San Juan. They are operating an extension of the Boss ledge and already have a tunnel forty feet into the hill. They think tbe prospects for developing a productive mine are very favorable. The Boss ledge is an immense deposit of gold quartz. Its correct widtb has not yet been accurately ascertained. But it is safe to assert that in the future it will make San Juan equally as famous as a mining center as it was during the zenith of the hydraulic hoom.

At French Corral we found the condition of things to be more favorahle than for many months past. Situated at this place is the Milton Company's famous mine. The gravel in this mine is exceptionally rich. Some of it has paid as high as eighty-one cents to the inch, and the average yield is 41.5 cents to the cubic yard, which is far ahead in richness of all other Nevada county mines. Hydraulicking is not heing prosecuted on account of the impositions of the Caminetti act. At the present time they are engaged crushing the cement gravel which is found in the bed of the deposit. A twenty-stamp mill is erected on the property and several men are employed. The gravel pays well for erushing. French Corral is rapidly coming to public notice as a fruit producer. Altogether the San Juan ridge is more prosperous than for a number of years past, and with the rehabilitation of hydraulic mining the people anticipate a return of the prosperity so prevalent during the hydraulic era.

Plumas.

HALLSTED MINE.—During the past ten days rumors have heen rife that the sale of the Hallsted, Duncan and other mining properties at Rich Gulch, on the East Branch, has heen effected, and many movements point in that direction. Last week Geo. Gahle, representing the noted mining man, Chas. W. Ertz, came up from Merrimack, went over to Long Valley, near Greenville, and put some men at work on the reservoir site located in the interest of the new company a few weeks ago. It is understood that the water to he stored in this reservoir will be conducted to the Rich Gulch mines referred to. Mr. Gable returned from there and went down to the mines via Spanish Ranch to investigate the question of getting a road down to the river, to arrange for laying in supplies and to choose a site for a sawmill. It is understood that the purchasers will erect this mill at as early a date as possihle.

The facts mentioned and other indications point to the sale of this great quartz property, which is destined to he one of the most gigantic operations inaugurated in the State. If reports are true, next seasou will he one of great activity in that section. The erection of one of the largest quartz mills ever seen on this coast is among the certainties.

We are not in position to state as a certainty that the sale has been made, but we are convinced that such is the fact, and that this great and valuable mining property, in the hands of the purchasers, will inaugurate an era of prosperity in this part of Plumas unknown for years.

Sierra.

Messenger: There are forty stamps running at the Bonanza ledge. The pay chute is thirty feet wide, and the owners claim there is sufficient ore availahle to last for twenty years or more.

The Wilson Bros. struck another pocket in Hungry Mouth ravine last Monday. They took out $164 in a couple of hours.

Tuolumne.

Democrat: The ledge of the Stanley-Kanaka mine, near Jacksonville, is from 75 to 150 feet in width and will average $5 per ton in gold. It is large enough and has gold enough in it to keep 200 stamps running for ten years. A San Francisco company is negotiating for it.

Faxon's mine, the Isabella-Gem-Consolidated, of Jeffersonville, is looked upon as one of the honanza properties of this county. It is the regular continuation of the Rawhide and Rappahannock mines and is ahout to he worked hy an Eastern company. The lode and attendant ground comprise thirty-eight acres, and the lode proper is over 100 feet wide. It shows free gold in many places and will average $7 per ton in free gold and sulphurets.

It is stated in Sonora that the Alabama mine and mill, near Jamestown, has heen sold for the sum of $25,000, and that the new company will soon begin operations. This mine ahout ten years ago was owned and operated hy W. N. Harris of Jamestown and J. Bell of San Francisco. Litigation overcome the enterprise and operations were stopped. The mine is forty feet wide, assays $5 per ton, is a true fissure and has fine hlack slate walls. It has a forty-stamp mill on it, one of the finest in the State.

ARIZONA.

PIMA COUNTY.—ROSEMONT.—A piece of copper from the new furnace was brought in. It is fine-appearing metal, very pure, and softer than the usual run of Arizona copper. The quality will make it superior for wire, and will give it a hetter price than ordinary. At the camp all is life and bustle. Men to the number of thirty or forty are working on roads from the various mines that dot the hills about. Forty or fifty men are employed in the mines, and are constantly developing at a good rate. The mines are all improving on development. The favorite mine of the group is the Chicago, which has a splendid ore hody, and high grade. Another mine desirable in a copper camp is one carrying a good proportion of zinc. This will be valuable as a flux.

GOLD ORE.—*Silver Belt:* R. E. Humphrey completed a very successful run of gold ore on Friday in the Klein mill. Thirty-five tons of ore worked yielded ahout $25 per ton in gold, or a total of $875. In fittiug up the mill, which entailed a considerable expense, Mr. Humphrey introduced several ideas of his own, and he is highly pleased with the result. The ore worked heautifully, coming up to ninety-five per cent of its gold value. Mr. Humphrey is now convinced that he has, in the Great Western mines, a very valuahle property and a paying proposition. The amount of $25 ore available is very large, and the mines will now be worked with redoubled energy.

LYNX CREEK. — Prescott *Courier:* Lynx creek and other creeks in that vicinity were flooded hy the rain. Several cloudbursts occurred on tbe head of Lynx creek within a short space of time.

Quite a number of men are working the bed of Lynx creek this fall, more so than usual. They report that they are about making wages.

Several parties have left this country for the southwestern part of the Territory where dry diggings are said to exist.

The old Howell smelter will be lined with corrugated iron and put in shape to run all winter. Plenty of ore is promised.

COLORADO.

BIG CYANIDE PLANT. — Ground will be broken at Florence next week, says the Denver *Record*, for the largest cyanide plant in existence for the treatment of gold ores, the South African tanks heing exclusively occupied with the treatment of tailings from the stamp mills. Messrs. D. H. Moffat, Eben Smith and Cbarles J. Hughes of Denver are the local directors.

Philip Argall, who recently received United States patents for important improvements in the MaeArthur-Forrest process—so far as the same is applicable to Colorado gold-silver ores—designed the proposed plant. He will go to Florence next week to start the construction. Contracts for the material and machinery have already been let. The new plant will contain six tanks, each with a capacity for 100 tons of crusbed ore. It takes about three days to complete the leaching of a single charge, so the capacity of the Florence works, to begin with, will range from 150 to 200 tons per day. The cost is stated at close to $60,000.

The site selected is on the line of the Florence & Cripple Creek railroad, about a mile and a half from the Rio Grande depot, iu the town of Florence. Ample provision is made for an early enlargement of the works to 300 tons per day.

BRITISH COLUMBIA.

AT CARIBOO.—Mr. Mann, a Montreal contractor, says: "Two miles up the south fork of the Quesnelle are the works of the Carihoo Hydraulic Mining Co. There are located two gold properties said to he the richest ever discovered in America. The share holders are nearly all Montrealers, including Sir William Van Horne, Vice-President Shaughnessy and Mr. Ogden of the C. P. R. The company has only heen organized two years, but is carrying on operations on a gigantic scale. They already employ 250 men, and the works are not completed yet. As an experiment the water was recently turned on for thirty-seven hours, and at the end of that time the sluice hoxes yeilded over $5,000 in gold."

WASHINGTON.

DEVELOPMENT WORK. — Okanogan *Outlook:* Dull as the times have been in the mining districts of this section of the Okanogan mining belt, it is estimated that upward of $50,000 has been expended in development work during the past six months. There is hardly a man in this part of the county who has not had an opportunity to at least provide himself with a winter's "grubstake," and yet we occasionally hear men kicking about hard times. But that is the way of the world.

The stamp mill at Fairview is again in operation after a temporary shutdown, and we are informed that it will continue running indefinitely. The company owning the mill bas placed a new man in charge and proposes to make a most thorough test of the ores of the district with a view of ascertaining their value, and, at the same time, to find out the adaptahility of the machinery for treating the ores. To that end, we are informed, the company has made arrangements with the owners of the leading mines in the camp to treat at least 100 tons of ore from each.

There is quite an excitement in the Hunter creek country, in Stevens county, over recent mineral discoveries. From all reports of the extent and richness of the ore hodies being developed, the Bunker Hill and Sullivan mines in the Cœur d'Alene country are "not in it." From one mine alone 100 tons of ore are being shipped daily to the Tacoma smelter. Robt. Myerhoff, the Coulee City freighter, has the contract for hauling the ore from the mine to the railroad, a distance of ahout fifteen miles. Jas. Monaghan of Spokane is one of a company which has recently honded and is now operating this mine. It is stated that the company paid $2500 down and is to have three years to pay the halance of the purchase price, which is $150,000, and is also to pay a royalty of $1 a ton for all ore sbipped or milled. It must indeed he a bonanza to justify the price and other conditions of the deal, hut we are told that the company will make a fortune out of the ore that is in sight. The ledge is said to have heen traced for five miles.

MONTANA.

ON THE RAMSHORN.—The Ramshorn Gold Mining Company, organized recently, has commenced active and extensive operations in the Ramsborn district, says the *Madisonian*. They are developing seven claims, of which the Pedro and Bernard have received the most attention, a goodly quantity of bigh grade ore having been blocked out of each of them. A five stamp mill is now being erected on the Bernard site on Ramshorn creek and will commence crushing as soon as it is completed. This group of mines has already made a record as an ore producer, the aggregate returns of the past running into the thousands, and now that a company of enterprising mining men having taken bold some good to Madison county may be expected therefrom. The officers of the new company are: George Conway of Glendale, president; Dr. Henry Jameson of Indianapolis, vice-president; Philip F. Igo of Indianapolis, secretary; and. Charles A. Harvey of Melrose, treasurer.

BITTER ROOT GOLD.—There is considerable excitement in Spokane over the finding of rich placers on French creek, about fifteen miles from Pierce City and about twenty miles from where Colgate's hody was found, says a Spokane correspondent of the Missoula *Democrat*. Several Spokane men explored the wilds of the Bitter Root mountains and with good success. They are said to have uncovered rich diggings and are putting in hydraulic works and getting in sbape for permanent camp. From tests made they expect to clean up from $15 to $20 a day for each man's work. Cahins are heing built and enough supplies laid in to carry them through the hardest kind of a winter. One of the party, M. C. Murtagh, is now at the Gillette Hotel arranging for the last shipment of supplies.

"We are satisfied that no prospector ever visited that country before," said Mr. Murtagh. "It is only about fifteen miles from Pierce City, but you must remember that seven and one-half miles are on edge. We have made a trail now, but the first trip was an experience. The rocks and hills are piled up just like ocean waves. We forced our way through the thickest kind of underbrush, climed over boulders and down bluffs and scrambled over fallen trees piled up twenty feet. But we got through finally.

"It is a magnificent timber country. The forest is so dense that it is always damp, and even when the underbrusb is cut and piled up it will not burn. There are places where the needles are mattered two and three feet deep on the ground. On our land alone, it is safe to say, there are at least a dozen huge red cedar trees that are from nine to thirteen feet in diameter, and so high that it hurts one to look up to the top.

"Besides the placer ground we have located ledges of free-milling gold quartz, samples of which I intend to have tested hefore my return. In short, the inducements that country offers to mining men are such that it seems strange it was not thoroughly prospected several years ago.

Coast Industrial Notes.

—The wire for Zimmerman's new cable across the Columbia has arrived at Pasco, Wash. It weighs 3000 pounds. The Columbia there is over 2000 feet wide.

—The Columhia river sturgeon fisheries, for many years an industry of considerable importance, are rapidly going into decline, owing, it is claimed, to the large numher killed hy fish traps and wheels.

—It is calculated that in '93 the mining yield of the State represented a value of $14,000,000, the wheat industry $14,000,000, the dairy industry $12,000,000, the fruit industry $11,000,000, the grape and wine industry $8,000,000, and the sheep industry $7,000,000.

—The *Iron Age* says: "C. P. Huntington has bought for Pacific coast delivery a block of 6000 tons of cannel (English) steel rails at a low price. This verifies the assertions repeatedly made by American manufacturers that they are in danger of losing the Pacific coast market."

—The *Overland Monthly* is authority for the statement that in California it costs 92½ cents to raise 100 pounds of wheat on ranches of 1000 acres, 83 cents on ranches of 2000 acres, 75 cents on ranches of 6000 acres, 60 cents on ranches of 15,000 acres, 50 cents on ranches of 30,000 acres, and 40 cents on ranches of 50,000 acres.

—The largest lumber deal ever made in British Columhia is said to have heen just arranged hy the Ross, McLaren Lumber Company, who are reported to have contracted with the South African Mining Company for 100,000,000 feet of lumher. The Ross, McLaren Company is composed of Eastern lumher men, who have two large mills, one near Westminister and the other near Vancouver. One has never heen worked and the other has heen shut down for three years owing to the low price of lumher. It is stated that hoth mills will be started up shortly.

—Tenders for the construction and maintenance of a Pacific cable were opened hy the Canadian Minister of Trade this week. Six offers have been received from English firms The figures will not he made puhlic at present, but in every case they are below the estimates made hy the engineers. No objection is offered to the length of the link of 7000 miles between Vancouver and Fanning island, the point designated as the landing place if a suitable one cannot be had in the Hawaiian group.

—Steel has not been used in constructing dams hitherto, but it will soon be tried in a work of that class on the Santa Ana river. This dam will he 100 feet high, and it is expected that it will cost ahout $80,000. The foundation of the dam will he made of steel tuhes imhedded in the solid rock of the river. The face of the dam will he made of plates riveted together and painted to preserve them from rust. Some of the advantages which steel is claimed to have over stone masonry in the construction of dams are that it is cheaper, more quickly constructed and less liable to he injured by the effect of earthquakes. If the present experiment proves a success, steel will douhtless largely take the place of otber material in the construction of dams.

Proposed Amendments.

TO THE EDITOR:—As it is proposed that the convention to be held here on the 19th shall consider and recommend some changes in the laws relating to the location, holding and purchase of mining claims, I would like to suggest a few radical changes which would greatly simplify matters and do away with the most of the litigation and uncertainty which attend the mining industry under the present complicated and burdensome regulations.

First, the side lines of all locations hereafter made should extend downward vertically like the end lines so as to avoid all controversy about apexes, dips, spurs and angles, cross ledges, etc. Claims may be twenty acres each as now, but let them be made without regard to the width on each side of the vein, and without limiting the width to six hundred feet, provided the length is proportionally shortened so as to include only twenty acres. This is to permit the following of the dip or pitch of the vein as deep as possible within the side lines. The locator should be allowed to shape his claim with reference to the course and pitch of the vein that he wishes to secure.

Second, instead of requiring the expenditure of one hundred dollars annually upon each claim, which is of little or no practical value to himself or the Government, let the locator pay one dollar per acre each year at the local U. S. Land Office, which will give him a whole year in which to look for his ledge, if a blind one, without fear of molestation by other prospectors. The hundred dollars now required to be expended will buy the claim of twenty acres at five dollars per acre. If a promising location, the miner might enter it at once by paying the hundred dollars and getting his Land Office certificate, which would be a perfect title. As long as the Government receives the highest price for the land, no controversy can arise as to its mineral character, that question having been determined by the payment of the price asked for lode claims. If the miner is willing to pay for the highest priced land, the Government should be satisfied, and no one else has a right to complain. If he has made a bad bargain, it is his own business. Is it not better than expending one hundred dollars annually in doing assessment work as it is now generally performed?

As to the disposition of the money thus paid to the Government, the system prevailing in Australia might well be adopted of sinking wells in the desert mineral regions, constructing reservoirs or otherwise providing water for the development of the mines; in constructing roads and bridges; in rewards for new discoveries and in assisting in the development or perfecting of new and better processes for extracting the precious metals from refractory ores, and in publishing geological maps and reports and scientific works relating to metallurgy in its various departments.

Many good reasons for the changes proposed might be furnished if space permitted. My purpose is to merely suggest them for consideration by the convention. T.

The Homestake Report.

The report of the superintendent of the Homestake Mining Company for the fiscal year ending June 1, 1894, has been made. The report shows that the net proceeds from gold bullion were $1,372,669 and from other sources $117,000, making a total of $1,489,669. In dividends there have been paid $181,000. The stock pays fifteen per cent every three months. There is sufficient gold ore in sight to keep the mill at work for eight years at its present capacity. This report touches only the Homestake mine and mills, and does not include the Highland, Deadwood-Terra and other properties generally included under the name of the Homestake mine. The United States has now pending a suit for $700,000 against the Homestake Mining Company for trespass on timber lands.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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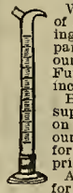
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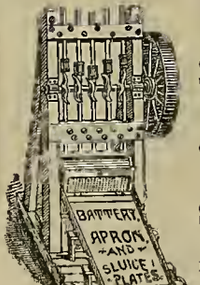

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Electrical Progress.

Trolleys and Road Improvement.

For several years past, says *Harper's Weekly*, there has been a zealous agitation in favor of the improvement of country roads. As pointed out from time to time in this paper, this agitation, this movement, is now resulting in a practical betterment of the highways in many localities, and a general discussion of ways and means to such ends in almost every enlightened neighborhood in the country.

But the road improvers and the makers of road laws need to be on their guard, for it has been demoustrated, time and again, in the near neighborhood of large cities, that so soon as country roads in populous neighborhoods, or between prosperous villages, have been graded and paved tbe builders of trolley roads pounce upon them, and divert them almost completely from the purpose for which they were intended. The extension of trolley lines into tbe country should be encouraged in all proper ways, but the public authorities, the law makers, and the people should insist that these trolleys should be located in proper places.

The pavement of a macadamized roadway is meant to drive on; it is injured very seriously by having a horse-car track on it; for driving purposes it is ruined by having a trolley track upon it—ruined as completely as though an ordinary railroad track were placed over tbe pavement. Nor should the spaces between the pavement and the ditches be used for railway tracks, for these spaces are admirable driving roads more than balf the time, and the rest of the time are needed for drainage purposes in taking the rainfall from the pavement to the ditches. A railway tract of any kind would interrupt this drainage, which is of the greatest possible importance, as the Macadam pavement is, after all, as much in the nature of a roof as anything else. The inventor of this system of road building maintained that if a road-bed were made dry by drainage, and kept dry by an impervious covering, it would carry any load that could be placed upon it. And the experience of four generations has proved that Macadam was right in his theory. But if we break this roof for a railway track, or if we interrupt the surface flow of water by a railway track on the side, then the whole purpose of the road construction has been defeated.

It is desirable, bowever, that trolley lines should be located near to the roads, for then tbey are easily accessible. The natural place for tbem is on the road side, beyond tbe ditcbes. This location involves the expense of grading for the railway road bed, and hence the builders of trolleys endeavor to secure permission to put their lines on the road-bed, where everything has been prepared in advance. This is as wrong as it can be, for such locations not only ruin the roadway, but make it dangerous to life. Tbere should be incorporated in every road law that no permission should be given to place a railroad on the roadway without referring the question to the popular vote of the township, and requiring that tbe railroad should then pay a rental of not less than ten per cent per annum on the first cost of the roadway. Such a provision of the law would compel trolley roads to seek and find other locations for their lines, and would leave the common roads for the uninterrupted use for which they were intended.

When the railroad came into existence, two generations ago, the effort to secure good common roads in America was abandoned, because it was fancied that with the development of the railroad the common road would not be needed. But experience has shown that the greater the travel on the railroads the greater the travel on the common roads, and hence that the latter are really a greater necessity than ever. And we will learn the same lesson from the extension of the trolley system, for travel begets travel. How unwise it will be, therefore, just as we are on the eve of securing for ourselves and our children a good system of country highways, to give them over to these private corporations for a use quite foreign to that for which we improved them!

Electric Furnace.

Much space is given in the *Comptes Rendus* to a description of a continuous electric furnace in which materials may be melted out of contact with the carbon vapor of the air. The body of the furnace is constructed of bricks of lime surrounding a central cavity, the sides of this cavity being lined with alternate plates of carbon and magnesia, the latter being next the lime, as, if the carbon plates were in contact with the lime, combination would occur at the high temperatures reached, liquid calcium carbonate being formed. The magnesia plates are irreducible by carbon, and therefore can only waste away by direct volatilization. The cavity is closed with simple plates, above which is placed a block of lime. The arc carbons pass through opposite walls of the furnace, and the arc is struck between tbem in the center of the cavity; below tbe arc and above the bottom a tube of pure carbon, one or two centimeters in diameter, passes through the furnace from side to side, and is inclined at an angle of thirty degrees to tbe horizontal. The ores to be fused are placed in this tube and the arc struck, the metal as reduced flowing down to the lower end of the tube, where it can be collected. Using a current of 600 amperes at 60 volts, an ingot of chromium of two kilogrammes weight has been produced; the fused metal was cast in molds of sesquioxide of chromium, to which it gave up any carbou it originally contained. The heated part of the carbon tube is transformed into graphite.

Poor Carbons.

There is probably no one thing connected with electric lighting so unsatisfactory as the carbons with which the market is generally supplied, and the improvement in them has by no meaus kept pace with that in the lamps in which they are burned. Perhaps the cause for this lies in the fact that the physics of the voltaic arc is so little understood. If it were clearly proven that the carbon was actually volatilized, or that it was simply carried from the positive carbon to the negative mechanically, and rendered incandescent during its passage, the makers would have a definite aim in their selection of materials and methods of manufacture.

THE largest use of electric light is by far that made in the United States, but the methods of production and utilization in use here do not appear to be quite so economical as those practiced abroad, says an exchange. The plants throughout Europe are generally on a much more modest scale tban here, except in a few such cities as Berlin, Hamburg and Vienna, yet recent statistics show that some of tbe smallest are competing successfully, not only with long-established gas works, but with petroleum. Very little of the current, however, is used for power purposes, and conveniences like the fan motors now running daily by the hundred thousand in the United States are well nigh unknown, so much so tbat when needed they are shipped from New York. In Berlin 19.9 per cent of the current is employed in lighting dwellings and hotels, but in Hamburg the same item runs up to 38.7 per cent. Store lighting in the larger German and Austrian cities averages 30 per ceut of the current. Berlin and Vienna use much less than 10 per cent of the current for driving motors in factories, stores, etc. Exceedingly little use is yet made of the current for heating. A large proportion of the stations have storage battery equipments; in this country this auxiliary is almost unheard of in central station operation, though nobody appears to know why.

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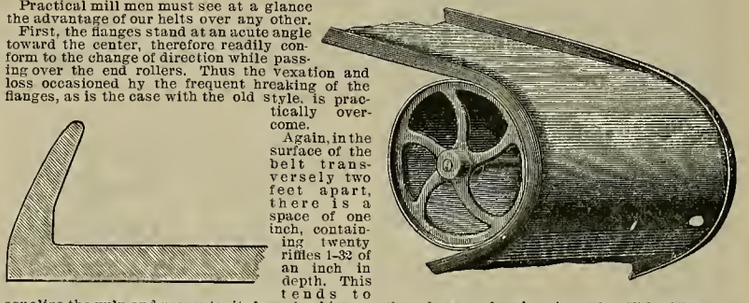

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Pumps twice as much water as the old Cornish pump and "only one-third the weight."
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Bucket and clack changed under water, saving expense of putting down another pump when the bucket or clack gives out under water. Bucket gearing lasts six times as long as the old gearing.
First outlay one-third less and works with ten per cent less power, "paying for itself in one or two years, according to the price of fuel."

WM. NANCE.....Grass Valley, Nevada County, California.

Practical Information.

Ball Bearings for Wagons.

Ball bearings are successful only when the balls themselves are of the highest quality, and the shells and axles are of the best steel, hardened and ground to the highest perfection, writes Prof. Sweet, in the *Rural New Yorker*. The limit of error in the best does not vary more than one-quarter of one-thousandth of an inch, or one-fourth the thickness of tissue paper. Such perfection is very costly, and the least dirt destroys the whole gain, for if the balls be stopped by any impediment, they are very soon ruined. Such accurate work is not likely to be properly protected or properly cared for in farm vehicles. Hence it is questionable whether the failures would not more than overbalance the advantages; besides, in the cost of drawing a load, a part is friction and a part is overcoming the ground resistance. The poorer the road the greater is the ground resistance, and this has a great bearing on the percentage of advantage, for supposing that, in the case of a trotting sulky, the friction is half the resistance and the ground resistance is the other half, now, if we reduce the friction one-half, the power required to draw the sulky would be reduced one-quarter or tweuty-five per cent; whereas if, in drawing a lumber wagon, the friction is ten per cent and the ground resistance ninety per cent—which on a farm and farm roads is about what it amounts to—then, by reducing the friction one-half, we have reduced the actual power required only five per cent. The time has not come when it will pay. It will be an infinitely better investment to use the same money to put wide tires on the wheels and cut off the front axles so as to bring the forward wheels the width of the tires nearer together than the hind ones. I have just been over a dirt road where 100 tons of limestone are drawn every day, aud the ruts were horrible when only common wagons were used. The road is now splendid, all owing to the use of half the number of wagons built as above described, while the ball bearings could at the best reduce the power to draw farm wagons only from five to ten per cent. The wide tires and short-axle wagous would reduce the cost of hauling on the farm roads forty to fifty per cent, aud the cost of the changing to ball bearings would equal the cost of the new wheels and front or back axles.

The Swiss Watch Schools.

The school the writer visited is the extensive one at Geneva. Being provided with the requisite permission, and escorted by an "alumnus" of the institution, he was shown every courtesy and afforded every opportunity to observe.

One is first ushered into the beginners' room. To enter, a boy must be at least fourteen. He will first be introduced to a wood-turning lathe and set at turning tool handles. He will be kept at this from eight days to several weeks, according to aptitude. Then he will be advanced to the work of filing and shaping screw-drivers and similar tools. These, and all other tools which he may afterward make, will be his own. Being, iu course of time, to some extent provided with tools, he will undertake makiug a large wooden pattern of a watch frame, perhaps as large as a dining plate. After he has learned just how this frame is to be shaped, he is given a ready-cut one of brass of the ordinary size, and he begins drilling the holes for the wheels and screws. All along the master stands over him and iustructs him. The circular pieces of brass which are put into his hands here he will go on with, and when the watch is completed that, too, will be his own.

He is then taught to make other fine tools, and to finish the frame, ready to receive the wheels.

Then he will leave the first room, and pass up into one where he is taught to fit the stem-winding parts, and to do other fine cutting and filing by hand, to make watches that will strike the hour, minute, etc., for which class of work the Swiss are so famous. One can readily conceive how exceedingly minute and exact such workmanship must be, particularly on the minute snail—that is, the guide which permits and arrests the striking, so that, in addition to the hour and the quarter, the very minute shall be sounded.—Theodore B. Wilson.

The Manufacture of Steel Tapes.

While the knowledge of the main processes in connection with the manufacture of steel tapes is regarded as a trade secret, the following particulars, which are of a general character, will be of interest. After the rolled ribbons have been tempered and ground, in quantities of from one to two dozen at a time, they are laid upon an iron table fifty feet loug, which has a standard on each side. The standards are of Government length at 62° Fahr. The ribbons, placed on this table in lines parallel to the standards, are made fast at one end, and a strain of twelve pounds under a spring balance is applied at the other. They are then printed with a wash or varnish not affected by acid, and then etched in a diluted nitric acid bath—the graduation being covered by the wax is left in the original surface of the tape.

BRASS work does not usually hold well on a taper steel arbor, but a thin film of chalk or three light chalk-marks about evenly spaced will help materially, and not affect the truth of the work to any appreciable exteut.

No. 9

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1. Engines and Boilers.
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31. Blake Pumps.
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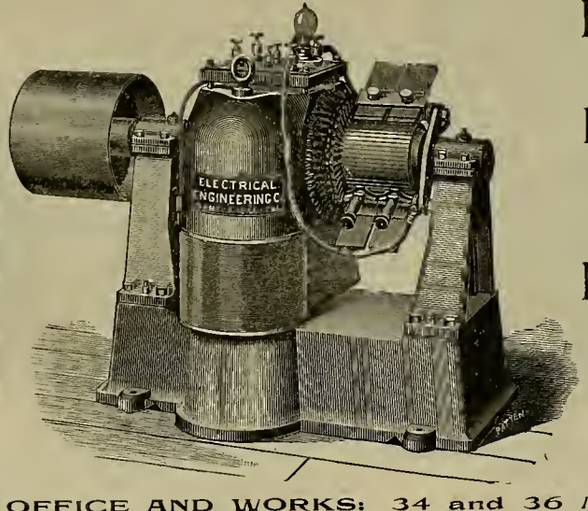

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ESTABLISHED 1863

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us to give advice which will save inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 220 Market St., S.F.

Market Reports.

The Markets.

SAN FRANCISCO, Nov. 15, 1894.

It was thought that the Chinese loan of £1,000,000 in London would favorably influence silver, but the subsequent sale of the loan at a small discount, and the fact transpiring that the net amount will he wholly used in the payment for war material hought in Eurcpe, did not tend to strengthen the market, which was almost stationary throughout the week.

New York Prices.

NEW YORK, Nov. 15.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Thursday	29⅛	63⅝	....	.....
Friday	29⅛	63½	9 50	3 10
Saturday	29⅛	63⅜	9 40	3 12½
Monday	29⅛	63⅜	....	.....
Tuesday	29⅛	63⅜	9 50	3 10
Wednesday	29	63⅜	....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	5c
New York Telegraphic Transfer	7½@
London Bankers' 60 days	$4.87½
London Merchants	$4.85½
London Sight Bankers	$4.88½
Refined Silver, per ounce	63⅝
Mexican Dollars, nominal	52½@53

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6⅝
Powdered, "	—	@	6¾
Concentrated, "	—	@	6¼
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 50	@	5 60
IRON.			
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Per lb	16¾	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5½
Pipe	—	@	4⅞
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 25
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			9 00
Wallsend			7 00
Scotch Splint			6 00
Brymbo			7 50
West Hartley			6 75
TO ARRIVE—PER TON.			
Australian	5 62	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Small profit is reported on Australian coal this season. It costs 8s in Australia, 14s freight, duty 40 cents, insurance 1 to 1½%; these are cited as causing it to cost about $6 a ton here. It is probahle, however, the stated freight rate possesses sufficient elasticity to justify a revision of the totals.

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 15, 1894.

9:30 A. M. SESSIONS.

200 Alta	26	100 Gould & Curry	60
500 Andes	60	550 Hals & Norcross	1 10
200 Belcher	80	350	1 15
100	79	200 Mexican	1 15
100 Benton	81	160	1 10
100 Best & Belcher	1 00	200 Justice	21
100 Bodie	86	550 Ophir	3 20
300 Chollar	71	800	3 15
400	70	600	3 10
800 Con Cal & Va	4 20	100 Savage	57
100 Confidence	1 10	100 S B & M	15
200 Con New York	04	100 Syndicate	03
100 Crown Point	59	400 Union	60
100	58	100	61
100	60	600 Utah	08

SECOND SESSION—2:30 P. M.

400 Alta	28	800 Hale & Norcross	1 15
100 Benton	95	100 Justice	22
100	1 00	300 L. Wash	07
100 Bodie	87	100 Mexican	1 15
700 Belcher	77	700 Ophir	3 15
100 Best & Belcher	1 05	300	3 10
100 Caledonia	12	300 Overman	13
200 Con Cal & Va	4 20	100 Savage	59
30	4 25	200 Sierra Nevada	80
600 Chollar	70	400 S Hill	04

UNITARIAN LITERATURE sent free by the Channing Auxiliary of the First Unitarian Church, cor. Geary aud Franklin Sts., San Francisco. Address as above. Mention this paper. *

BACK FILES of the MINING AND SCIENTIFIC PRESS (unbound) can be had for $3 per volume of six months. Per year (two volumes), $5. Inserted in Dewey's patent binder, 50 cents additional per volume.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	13	10c	Oct 30, Dec 3, Dec 21	C E Elliot, 309 Montgomery
Best & Belcher M Co, Nev	57	25c	Nov 12, Dec 18, Jan 8	M Jaffe, 309 Montgomery
Challenge Con. Nev	17	5c	Oct 31, Dec 4, Dec 27	C L McCoy, Mills Building
Gray Eagle M Co, Cal	38	5c	Nov 12, Dec 14, Jan 11	C C Harvey, 309 Montgomery
Justice M Co, Nev	57	5c	Nov 2, Dec 6, Dec 27	R E Kelly, 309 Montgomery
Navajo M Co, Nev	27	10c	Oct 3, Nov 8, Dec 3	J W Pew, 310 Pine
North Banner Con T Co, Nev	32	3c	Oct 6, Nov 6, Nov 27	C E Green, Fourth and Townsend
Occidental Con. Nev	17	5c	Nov 1, Dec 4, Dec 27	A K Durbrow, 309 Montgomery
Overman S M Co, Nev	72	10c	Nov 14, Dec 19, Jan 9	G D Edwards, 414 California
Quincy M & W Co, Cal	1	20c	Oct 31, Dec 11, Jan 4	W C Ralston, Mills Building
Scorpion M Co	6	5c	Oct 4, Nov 9, Nov 30	Geo R Spinney, 310 Pine
Starlight M Co, Nevada	3	10c	Oct 10, Nov 19, Dec 10	H R Williar, 321 Pine
Utah Con M Co, Nev	20	5c	Sept 28, Nov 1, Nov 20	A W Havens, 309 Montgomery
West Con Va M Co, Nev	3	....	Sept 27, ... Nov 27	P H Andros, 324 Pine

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Occidental Con	A K Durbrow, 309 Montgomery	Nov 19

Mining Share Market.

SAN FRANCISCO, Nov. 15, 1894.

Shares held up during the week and shorts are not happy. The Con. Cal. & Va.'s $54,000 dividend and the probability of another dividend from the Bodie Con. were felt. Hale & Norcross advanced, though why no one seemed to know. Favorable reports are received from the new strike in Ophir. The drift is now almost to the north boundary of the Con. Va. The latter reports a cash balance of $230,276, with all the expenses for October paid. After paying the $54,000 dividend, there remains $186,276.55 in the treasury.

The Nevada mill has closed down for two weeks. The Morgan mill started up again yesterday.

The Palmetto group of mines in southeastern Nevada is reported sold to an English syndicate who, it is expected, will put in reduction works next spring. The ore is free milling gold.

The following illustrates the changes of the week:

MINES.	8	15
Alpha	.....	.....
Alta Consolidated	.....	$ 28
Andes	$ 62	60
Belcher	83	80
Best & Belcher	.....	1 05
Bodie	90	87
Bullion	34	.....
Challenge	.....	.....
Chollar	71	71
Confidence	1 05	1 10
Consolidated California and Virginia	4 60	4 25
Consolidated New York	.....	4
Crown Point	60	60
Exchequer	.....	.....
Gould & Curry	.....	60
Hale & Norcross	1 00	1 15
Justice	18	22
Mexican	1 30	1 15
Ophir	3 30	3 20
Overman	19	13
Potosi	.....	.....
Savage	58	59
Sierra Nevada	88	80
Union	.....	61
Utah	10	8
Yellow Jacket	69	.....

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 30, 1894.

528,498.—CLOTHES RACK—T. M. Anderson, New Whatcom, Wash.
528,355.—SHIPPING CRATE—R. B. Bain, S. F.
528,269.—LOCK—L. L. Bettys, Oakland, Cal.
528,363.—BOOT-JACK—W. H. Cole, Portland, Or.
528,464.—SHOELACE CLAMP—L. D. Craig, S. F.
528,432.—BED-CLOTHES CLAMP—G. H. Holidge, Tacoma, Wash.
528,434.—SEPARATOR—R. W. Jessup, Los Angeles, Cal.
528,371.—CAN OPENER—C. F. Keller, Danville, Cal.
528,231.—VENTILATOR CAR—H. H. Love, Sacramento, Cal.
528,331.—SASH BALANCE—G. Lusher, Pasadena, Cal.
528,375.—DRENCER—C. Meier, S. F.
528,377.—CARBURETOR—O. Moncur, Yuba, Cal.
528,442.—CONCENTRATOR—J. Norbom, S. F.
528,483.—GAS ENGINE—J. & W. Paterson, Stockton, Cal.
528,342.—MOLD—E. L. Ransome, Oakland, Cal.
528,391.—TENT FASTENING—J. J. Rinn, S. F.
528,392.—TENT—J. J. Rinn, S. F.
528,393.—TENT—J. J. Rinn, S. F.
528,394.—TENT—J. J. Rinn, S. F.
528,305.—CAN CRIMPER—H. Schaake, S. F.
528,306.—CAN CRIMPER—H. Schaake, S. F.
528,447.—LACE, ETC., HOLDER—J. M. SCHLESINGER, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Colorado Mining Incorporations.

The following are among the most recent Colorado mining incorporations:

The Giles Mining and Milling Company. Capital stock, $250,000. Directors—George A. Tenny, M. L. Luebhen, Theodore Miller, H. F. Luehhen and J. H. LcClair. Object, to operate in Boulder county.

The Ferrum Mining Company of Lake county. Capital stock, $500,000. Directors—W. L. Thompson, G. E. Taylor, J. A. Ewing, R. B. Estey and C. T. Limberg.

The Iron City Mill Company of Gilpin county. Capital stock, $50,000. Directors—Lyne S. Newell Jr., S. V. Newell, F. Givvener Jr., and William Jacoh.

20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAN MAKING MACHINE.—Robert D. Hume, Gold Beach, Oregon. No. 528,673. Dated Nov. 6, 1894. The object of this invention is to provide a machine for making can hodies from the flat sheets of metal and applying the heads thereto in a single continuous operation, and in conjunction therewith of an automatic feeding mechanism by which the sheets of metal are successively delivered to the machine wherein they are bent into shape, side seams formed thereon, said seams interlocked, closed and soldered. It consists of a feeder hy the pneumatic action of which sheets of tin are lifted from the tahle upon which they are placed in a pile, and delivered thence to a poiut where they are seized hy carriers and reciprocated horizontally along the horn, around which they are gradually shaped into cylindrical form, having hook-shaped flanges formed upon the edges, and mechanism hy which these edges are iuterlocked and closed, a soldering mechanism over which the closed seams are passed so that the solder is applied to the seams, and a mechanism at the end wherehy the prepared heads are applied and crimped upon the end of the can body in readiness for soldering.

UNION OF TRANSVERSE METAL BARS.—John T. McCormick, Sau Francisco. No. 528,677. Dated Nov. 6, 1894. The object of this invention is to provide a means for rigidly uniting bars which cross each other transversely so that they may form either grills, gratings, door-mats, fences or other structures. It consists in arranging sets of hars having plain untwisted portions between the adjacent twisted portions with the other series extending at right angles through slots in the untwisted portions of the first named bars, so that the twisted portions upon each side of the slots form locks to secure the hars together with the edges of hoth sets of hars uppermost at intervals.

CARD CATALOGUE.—A. J. Rudolph, San Francisco, Cal. No. 528,692. Dated Nov. 6, 1894. This invention relates to improvements in what are termed "card catalogues." It consists in such a construction of the independent movable card adapted to stand on edge that it shall have one of its sides smooth, flat and ruled, and its opposite side recessed at points inside of its marginal lines sufficiently to receive a slip which is pasted therein, whereby the surface of the slip will not project heyond the plane of the face of the card.

BINNER FOR BOOKS AND PAMPHLETS.—A. J. Rudolph, San Francisco, Cal. No. 528,693. Dated Nov. 6, 1894. The object of this inveution is to provide a means for hinding abstracts, pamphlets, periodicals and other hooks in circulating libraries so as to produce a more compact and stronger hook, so hound that when spread out for use the several sections will lie suhstantially flat without any gah at the back. It consists of rigid channel plates adapted to receive and hold the edges of the parts to he used, hinge hands passing through them and a hinge section which are united together heyond the edge of the parts, flexihle channel pieces secured to the parts to he bound, retained in place within the rigid channel pieces extending heyond the edges thereof, and supplemental hent plates fitted into the hottom of the channel sections with holes to receive the hinge rods aud retain them in central position within the channels. It also comprises flexible protecting strips and a means for attaching the name, lahel or index upon the rear of the hinding so that it will he exposed when the book is complete and closed.

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Notice of Assessment.

GARNER CONSOLIDATED GOLD MINING COMpany. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1894, an assessment, No. 1, of 5 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 56, No. 3 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of December, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, 309 Montgomery St., Room 56, San Francisco, California.

NOTICE OF ASSESSMENT.—OCCIDENTAL CONsolidated Mining Company: location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey Co., Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of November, 1894, an assessment, No. 13, of five cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth day of December, 1894, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the cost of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

ANNUAL MEETING.—THE REGULAR ANNUAL meeting of the stockholders of the Occidental Consolidated Mining Company will be held at the office of the company, room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on Monday, the 19th day of November, 1894, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, November 16, 1894, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from E. P. Hagar & Samuel Peck in the U. S. Grant Mine, near Blue Tent, Nevada Co., Cal., to impound tailings behind brush dam in ravine below the mine; from John Black in the Spanish John Mine, near Rough & Ready, Nevada Co., Cal., to impound tailings behind brush dams in blind ravines and pit; from the Good Hope Mining Co., in the Richmond Hill Mine, near La Porte, Plumas Co., Cal., to impound tailings behind log and crib dam in Onion Valley Creek; from Leonard Dormody in the Martelle Mine near Salmon Falls, El Dorado Co., Cal., to impound tailings behind dams in Martelle Creek; from J. M. Read & N. E. Beckwith in the Pine Grove and Hidden Treasure Mines, near Pine Grove, Amador Co., Cal., to impound tailings behind brush dams in Saw Mill Gnich and behind log and rock dam in Grass Valley Creek; and from the Gold Run Ditch & Mining Co., in the Gold Run Mine, near Dutch Flat, Placer Co., Cal., to impound tailings behind a rock filled dry masonry dam, 100 feet high, in the North Fork of the American River, about 2 miles above its junction with the Middle Fork, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Nov. 26, 1894, at 1:30 P. M.

Removed to 434 CALIFORNIA ST., near Montgomery.

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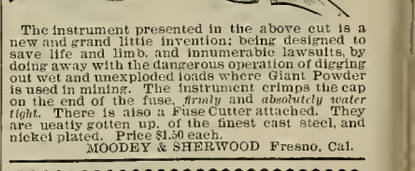

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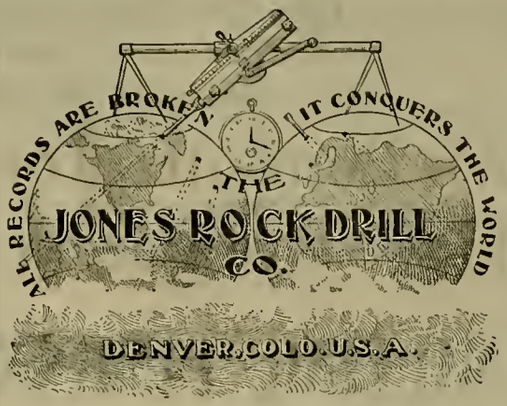

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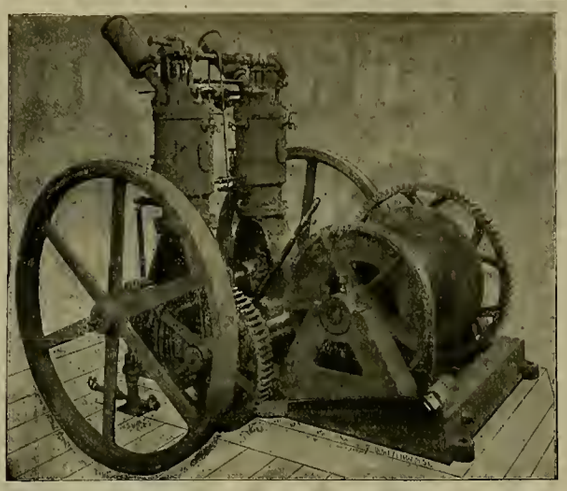

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AND PACIFIC ELECTRICAL REVIEW.

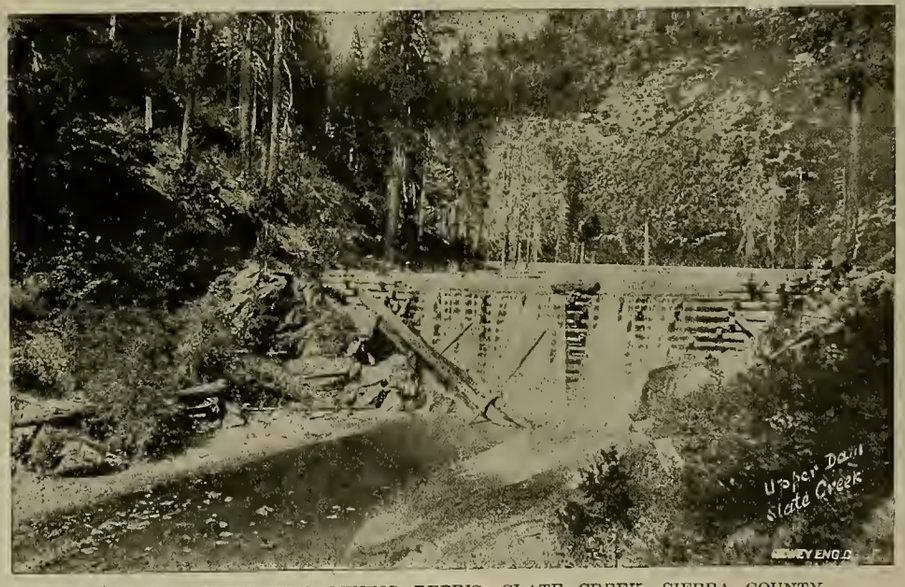
VOLUME LXIX. Number 21. SAN FRANCISCO, SATURDAY, NOVEMBER 24, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Debris Dams.

As is generally understood, under the provisions of recently enacted laws, all hydraulic mines operated in the drainage basins of the Sacramento and San Joaquin rivers must impound their debris behind dams or other restraining works constructed at their own expense. Even before the passage of these laws, some of the mines, to obviate injunctions of the courts, constructed such dams, two examples of which are given on this page. The original photographs from which these pictures were made were obtained by Major W. H. Heuer of the U. S. Debris Commission, who is quite an accomplished amateur photographer. The larger dam is one on Slate creek, in Sierra county, and shows the deposit of debris behind the barrier. The smaller dam is on Rock creek, in the same county.

DEBRIS DAM ON ROCK CREEK, SIERRA COUNTY.

While these two dams were built before the passage of the Caminetti law, they are of a similar nature to those now being constructed under the provisions of that law. A narrow gorge or canyon is naturally selected as a site, and as the reservoir fills up, the dam is increased in height. The debris collecting in these reservoirs soon becomes compacted or cemented in a mass, and even should a dam break, there is no danger from any sudden irruption of water below, since spill-ways are provided so that the water may be constantly passing off and only the debris remains behind the dam. In this way no large bodies of water can collect behind the dams, which, therefore, need not be of a very permanent nature. Some of the log dams for this purpose put up twenty years or more ago are still in a good state of preservation, and the material behind them has been practically cemented into a solid, compact mass.



DAM FOR RESTRAINING MINING DEBRIS, SLATE CREEK, SIERRA COUNTY.

ALMOST our entire space this week is devoted to the proceedings of the Miners' Convention, and even then we are not able to conclude the account this week. It has been the aim of the MINING AND SCIENTIFIC PRESS, however, to give the proceedings in full because the 300 or 400 delegates present only represent one in ten of those interested in what took place. Through our columns those who had to remain at work in the mountains may read fully what was done. It is only to be regretted that the enthusiasm and energy everywhere apparent cannot be also reproduced.

THAT splendid and complete banquet at the Palace Hotel, given to the miners by the merchants, manufacturers and bankers of San Francisco, will be a topic of discussion for months up in the mountains of California. No handsomer compliment was ever paid to the representatives of any industry by the business men of this city.

THE little silver badge, representing a crossed pick and shovel, worn by all the delegates to the Miners' Convention, was the happy idea of Secretary Ralston and was in great demand even from those not delegates.

The Banquet to the Miners.

The banquet tendered to the delegates of the Miners' Convention by the merchants, manufacturers and bankers of San Francisco at the Palace Hotel on Wednesday evening was a very enjoyable affair both to hosts and guests. Some 300 were present, and addresses were delivered on the part of the entertainers by Wm. Watkins, President of the Board of Trade; Mayor-elect Adolph Sutro, Congressman James G. Maguire, A. S. Hallidie, Irving M. Scott and Andrew Carrigan; and on behalf of the miners by J. H. Neff, President of the California Miners' Association; Judge Niles Searles, S. K. Thornton and Chas. G. Yale.

The banquet was a high compliment to the miners of the State and shows the appreciation in which the industry, as represented by the California Miners' Association, is now held by the foremost business men of this city. It is a thorough and the best proof of the complete change of sentiment which has taken place in connection with this branch of industry during the past few years. Here were the foremost merchants, manufacturers and bankers of the metropolis entertaining at an elaborate and expensive banquet the hardy miners from the mountains of California, and assuring them by word and deed of their great interest in all that would advance the miners' cause.

The compliment was one which was highly appreciated by the representatives of the mining industry present, and should be by all connected with it throughout the State. It augurs well for the future of mining in California when such a body of representative men see fit to pay such unsolicited and complimentary attention to the miners of the State.

MANY of the speakers who were not miners, who came before the convention, expressed the conviction that gold mining was now the most prosperous industry in this State, and one which but needed the investment of capital to almost double its annual product within a few years.

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Our latest forms go to press on Thursday evening.

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J. F. HALLORAN.....General Manager

San Francisco, November 24, 1894.

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MISCELLANEOUS.—The Miners' Convention, 322-23-24-32-33. Mineral or Agricultural Character of Land, 325-26. Department Rulings and the Miners, 328. Delegates to the Miners' Convention; The Nicaragua Canal, 330. Notices of Recent Patents, 332. Concentrates, 336.

THE re-election of the old officers of the California Miners' Association was a deserved compliment, as they have all worked hard in their respective fields and are familiar with the proper way to conduct the organization.

THE Astronomical Society of the Pacific holds a regular meeting in the rooms of the Technical Society of the Pacific Coast, 819 Market street, this evening at eight o'clock. Papers by Professor Holden, W. H. S. Mouck of Duhlin, Roger Spragne of Denver, Professor M. McNeill of Lake Forest, Messrs. Schaeherle, Barnard, Campbell, Tucker and Perine of the Lick Observatory, Mr. Burckhalter of Oakland and F. R. Ziel of Alameda, will be presented. The meeting is open to the pnblic.

THE PRESS is informed by Mr. P. George Gow, California and Nevada agent for the MacArthur-Forrest cyanide process, that the decision recently rendered in Londou was in the High Court of Justice, from which an appeal has been taken to the House of Lords, where he has reason to believe, from news received from London, that the decision will be reversed. He further states that the decision can in uowise affect American patrons, and in any event this suit only applies to the gold dissolving process, and not the precipitation patent.

AFTER readiug the accounts of the Miners' Convention in the daily papers iu the city, which gave extended space to the proceedings, some of those few anti-debris agitators who have gained notoriety in that cause, ought to realize the change of sentimeut among the people in connection with mining in California. The standing of those who came before the convention and addressed it, and of those who entertained the miuers at the banquet on the conclusion of the proceediugs, should he sufficient warrant that the best and most influential people of this State are anxious to see a more geueral resumptiou of gold mining in this State, and willing to do all they can to aid it.

THE proceedings of the Fourth State Miners' Convention, held this week, were harmonious in every respect. This convention was the most successful one the miners have had, and much good will result from it. There was a full representation from the mining counties, and the members were addressed by the Governor of the State, the Governor-elect, a United States Senator and several Cougressmen, as well as hy many prominent men connected with the miuing industry. The main topics of discussion related to desired changes in the mining laws of this country, and those suggested will he found in another column. We print in full the proceedings of the convention as far as our space will permit, and will give the conclusion in our uext number. We shall also print next week the technical papers read. The convention was in session for three days, dnring all of which time the greatest interest was manifested in the proceedings.

THE MINERS' CONVENTION.

Proceedings of the Annual Meeting of the California Miners' Association.

The Speeches, the Resolutions and the Suggested Changes in the U. S. Mining Laws.

The California State Miners' Convention met at San Francisco on Monday, Novemher 19, 1894, at the Metropolitan Temple. The convention was called to order hy President Neff who opened the proceedings by saying:

Gentlemen of the Miners' Association of California:—In entering upon the discharge of our duties as delegates to the Miners' State Convention, it affords me pleasure to say to you that, since our last meeting, such progress has been made in the cause of the miners that to-day prosperity heyond our expectations reigns in the mining counties of this State. We do not feel the depression of hard times there as our friends do who reside in the agricultural or horticultnral districts. It was stated when this organization first met in convention here that it was for the purpose of hringing together the miner and the farmer; to bring ahout a better understanding hetween the two old industries of the State. Onr friends of the valleys are now our friends, indeed; litigation between the miner and the farmer has ceased to a great extent, and each one is pursuing the trend of his calling industriously and honestly.

It has always heen a source of pride to me that the miner has been and is a law-ahiding citizen; that, although laboring under what they thought to be a great wrong, they have always submitted to the decrees of court and abided hy its decisions. I do not propose to detain you with any extended remarks. The litigation that has been had, through the Miners' Association, is a matter of history to the whole people. A great deal more is to he accomplished. The time has not yet arrived when this association can afford to dissolve. Every man who is honestly and fairly imhned with the spirit of conducting this association fairly between man and man, and in the interest of the great industry of mining, should lend a helping hand and press forward and aid ns in the discharge of our duties.

The first husiness in order will he the appointment of a Committee on Credentials. A motion will uow he entertained.

MAJOR MCBRIDE: I move that the Chair appoint a Committee on Credentials of fifteen memhers. This motion was duly seconded and carried.

THE CHAIRMAN: The Chair desires to state that it will require a little time for the formation of that committee, and as Governor Markham has kindly consented to deliver an address, the proper time to hear him would be uow. I desire to say to the convention that after the address from Governor Markham, he will hold a short reception here and every delegate can come and shake hands with the Governor of the State of California. It is scarcely necessary for me, gentlemen of the convention, to say that I take great pleasnre in introducing to yon Governor H. H. Markham.

Governoi Markham addressed the convention as follows:

Mr. President, Friends, Members of this Convention:—This is indeed an unexpected pleasure for me, for when I was first invited to come here and meet you, I felt that it would be impossible. I had been from my office for nearly ten days and I knew what that meant when I should return and find my table and desk a foot deep with debris. I did feel, perhaps, that the Chairman would delegate some good honest miner to help me make a general cleanup. I will say, however, that after listeuing to the eloquent appeal that was made to me by your secretary, Mr. Ralston, who described to me the manner of man that would be here and the objects of this convention, that I began to feel interested, and the longer he talked, the more I felt like coming. And, gentlemen, here I am.

When I asked Mr. Ralston what I should say in my speech if I made one, he said: "You can say almost anything; just welcome the friends from abroad and say a kind thiug to our owu people, and tell them what California bas done by way of producing the precious metals, and tell them how much every one of us would desire more of each commodity than we now have, and that will answer the purpose." He talked for pretty nearly half an nour, and he delivered a splendid speech to me. With your permission, I will recite it to you.

I will say, however, to you that I have left my work and come here without the slightest preparation. I feel sorry for it, because you are entitled to more of a speech than will be possible for me to deliver to you. I have been kept too busy. I got up at four o'clock this morning and I am here. I have got to return again to-night. I will say to you, gentlemen, that no organization in this State would induce me to do more than I have done to come here, and I would not attempt to deliver a speech to you at this time did I not know that the heart of the miner is always charitable.

Now, my friends, I have no authority to speak for this city, but I will say to you that I am satisfied that your stay here will be made pleasant and agreeable and that your session will be made profitable here in San Francisco, and that the people here will take care of you, and we all know what that means in San Francisco. San Francisco's reputation in that regard is world-renowned. No city in the world has a better reputation in that respect than San Francisco; and, Mr. Chairman, what could be more appropriate than the holding of this kind of a convention in this kind of a city and with this kind of people?

Who came here first? Who laid the foundation for this magnificent city and gave her the name and fame of the metropolis of the Pacific coast? It was the miuers. Where is there a city or a people that have been truer friends or kinder to the miner than San Francisco and its people? Mr. Chairman, San Francisco has been the home of the miner, the friend of the miner, and, I might almost say, the product of the miner. The miner has furnished to this city a wealth of brain, of intelligence, of enterprise, of hospitality, of kindness and friendship that is exceeded by no State in this country. I know, Mr. Chairman, that I have been charged with being a friend of the miner. I will neither deny or affirm that accusation at this time, but I will say that if I am a friend of the miner every one of you are equally guilty.

In my inaugural address to the Legislature four years ago, I called the attention of that body and of the people of California to the question of mining in this State. In my welcoming address to the Chief Magistrate of this nation, I modestly called his attention to the mining interests of California. In my speech at the World's Fair last year, I said concisely what I felt in regard to the mining interests of California, and if you will bear with me I will repeat it to you here. It is in better language and more concise than I could possibly give it without calling your attention to it especially. I think I can repeat it without my glasses, but I may make a mistake, and if you will excuse me I will look at it just as I did that time. This is what I said to the people at the World's Fair (referring to memorandum.) What I said was for the purpose of instilling into the minds or the people of the United States what California has done for the welfare of this whole country and what I think the whole country could now afford to do to assist us in mining in California—and this is what I said:

"While we are all proud of the financial standing of this nation, California must be credited with furnishing the gold and saving the country in her direst need. And let me say right here that three-fourths of that gold was taken away without yielding to California a farthing to show for it so far as her internal wealth was concerned. In fact, but a small portion of it was left to California for the exclusive use of California. Yet it saved the financial credit of the nation and placed her in the prosperous condition which she occupies to-day. The nation is welcome to it, for California can still keep house without it, and she is able to continue doing these charitable acts with her usual becoming modesty.

"Between the years 1848 and 1878, California produced for the use of this country $1,185,550,000 in gold, and since 1878 she has produced $230,000,000. In addition to this, she has produced many millions in silver, all of which has contributed to the financial interests of this whole country. It is safe to say that locked up in her hills to-day, awaiting the action af the Federal Government to aid us in its extraction, we have as much gold as has already been taken out, and I am convinced that this Government can resort to no means so speedy, certain and economical to furnish it with gold and restore its depleted treasury as to permit the hydraulic mining now enjoined by the Federal courts to be carried on with proper engineering safeguards so as not to destroy the agricultural and horticultural industries. It can be done and it will be done, and this country must so earnestly undertake the work as a national enterprise and carry it to a successful conclusion."

Gentlemen, that is what I said to the people of the United States; I will not take back one word of it to-day. In my address to the President when he reached here, I said to him in the course of my remarks that if the gold deposits of California belonged to either France, England, Germany or Russia, those nations would take hold of it as a national enterprise and lend a hand to the miner, for its extraction. I said to him, why should uot America do tbe same thing? I am told by your secretary that the Australian Government is expending vast sums of money to assist her miners in the development of her mines. I am told by him that other countries are doing precisely the same thing, while here in America our Goverumeut is not lifting a hand to assist them—and why not? The last Congress was in session, in extra session and regular session, nearly a whole year. We all know that it costs this Government about $33,000 a day to run Congress. You may not have figured it up, but I have. Nearly $33,000 a day in costs to run Congress, and all we received from that body to assist the mining interests of California was $15,000—less than half a day's pay for running Congress; or let me put it so that you never will forget it: When I say to you, the sessions of Congress are from twelve o'clock noon until five o'clock in the afternoou, making five hours, you can readily see that the cheapest orator in Congress, that talks two hours, costs the Government more thau they have done for us in our mining, so far. Now, my friends, I sincerely believe that with a united, earnest, intelligent, determined effort, you will succeed in getting some money out of that body to assist, or you ought at least to get as much as our friend Senator Ford induced the State of California to appropriate, $250,000. This is not an unnatural request to make of the National Government. The National Government has always insisted on exercising a pareutal care over our mining lands and our mining industries. She is exercising a jealous care to see that no one got an acre of mining land who did not pay twice for it what he ought to pay for auy other land. Therefore I say to you that by assisting in the production of gold in California she is establishing no extraordinary precedent, no legislation, no helping of any particular class or any particular locality. If she assumed to control the mining lands of this country, tben what is the harm in her coming forward and doing those things which will allow the miners to extract the gold tbat we know is locked up in our hills. It is estimated that it costs the Government or the people of this country at least $100 worth of commercial energy to obtain $5 net in gold for any commercial transaction with a foreign nation. Now, if that be true, there is not a miner here who will uot take a contract with the Government of the United States to give them five times that in gold if they will put up the $100 to help him out.

I realize the fact, my friends, that many people imagine that this is a work which is impossible—too gigantic—that it can never be accomplished. Now, I will not assume to say to you that this can be accomplished—I mean the practicable working of it; that I have never assumed to state, but I do know tbat with 70,000,000 of American people and their intellects that they can, out of that mass, devise some means that will do this work, and do it satisfactorily. We do know tbat the National Government, by engineering skill, has reservoired the waters at the head of the great Mississippi river so as to equalize its flow and promote navigation. We do know that the National Government, through engineering skill, has controlled the deltas at the mouth of the Mississippi and made that portion of that great system safe for navigation. That being the case, I say to you that the problem of handling tbe mines of California is no more difficult than the latter, and that if we can enlist the earnest support of the people of this country it will be done, and I hope to live to see it accomplished.

I am afraid that I am detaining you too long (cries of "Go on, Governor").

I will say, as your chairman has said to you, that the first visit I made into the mining countries four years ago as I passed from town to town, and place to place, and there saw the depression, saw the consternation and the sorrow that surrounded every little hamlet almost in the mountains, that it excited my sympathy; and as I said to your presideut, if I had found them prosperous, I perhaps should never have thought of doing anything extra for tbem. But when I went there just four years afterwards, going over the same ground, I never was so much pleased with anything in my life as I was to see the change, the cheerfulness, the hope on the face and countenauce of every man I met. I do not know if they continue as prosperous as they have for the last year or two whether I will have any more sympathy for them or not; but it is cheering to know, and it is gratifying to say to you at tbis time, that when I read in the paper this morning that this Miners' Association has, in a substantial way, recognized your worthy president, while I wanted his badge worse than anything else in the world, I would have voted to give it to "Old Jake."

Now, my friends, I have talked to you about the gold part of this. I have never said a word to the miners of California that I know of in regard to silver; and if I never have, it is undoubtedly due to my innate modesty as a silver miner. I will say to you that my success in mining was in silver mining, and I have said but little upon the subject for the reason that men all over the country charged that the silver men were the men most deeply interested in the production of silver. I will admit they should he, but I will say to you here now, without going into items, that as sure as you live, the time is not far distant when the people of this country have got to see to it that silver is put on a parity with gold. I sincerely believe, and I have always believed, that it requires simply the substantial endorsement of this great nation to compel other nations to recognize its merits. I do not assume to say how this will be brought about, but I do know that silver is oue of the precious metals. I do know that it has so been considered since the earliest history of mankind, and I do know that it is not the enemy of the human race that some people would have us believe it is.

My friends, I think I have talked enough about mining, but I will not leave without saying a word as to California. I assure you that I can deliver no more patbetic or brilliant eulogy on the State of California than to say to you that I came here because I was obliged to and I never will leave here unless the same condition prevails.

The greatest criticism that I can make upon the people of California is the fact that they do not know California themselves; and the greatest credit I could give to them is the fact that they are positive, every one of them, that they are living in the Garden of Eden, and they are the Adams that make it. Now, do you know that that is one of the most cheerful omens for California. You stop and think of it. You never went into a place in California but what the people who lived there will tell you there is nothing like it on the face of the earth, and they are sincere in it. Now suppose we reverse it; suppose they said "this place amounts to nothing, but the next place does." I tell you it is the loyalty of Californians to their

own locality and to their own State and to the Pacific coast that is bound to make California the chief State of the Union before we are done. I say to you today that I would prefer to be Governor of the State of California than of any other State in the Union. If you would lay down the certificate of election of every State in the Union, I would take California, and I will tell you why. Because the people are made up of independent minds like the miner and the old soldier—if they like you, they like you all over, and if not, it does not take you long to find it out.

Now, my friends, I have talked to you a great deal longer than I intended to but it has given me a great deal of pleasure to meet you; and after I leave here and start home to Sacramento, I will think of twice as many nice things as I have said to you, but I will say that wherever I meet you, under all circumstances, I shall be glad to shake you by the hand and to be considered one of you. I have not intimated what you should do in this convention, and I do not intend to. I know that would not do for me, because it is your duty to tell me what I should do to help you along, and if you will do that, I will obey orders as long as I can. I thank you.

Three cheers were then given for Governor Markham.

After the recess the chair announced the Committee on Credentials.

While the committee was at work the chair introduced Judge Barham, Congressman-elect from the First District. Judge Barham said:

Mr. Chairman and Gentlemen of the Convention:—I had the pleasure and I have the recollection of having seen the pick and shovel in California as early as 1849. (Pointing to the silver badge.) I am not a native son, but I got here as quickly as I could. I have talked all over the First Congressional District, not only once but twice, in the interests of the miners of California, and when I say that, I have to say that what I said in the mountains I would say in the valleys. I have said nothing that did not at all times guard the interests of the farmers. There is no reason on earth why the interests of the miner and farmer should not go hand in hand. When you develop the mining resources of this country, and again permit us to turn out $10,000,000 or $15,000,000 of gold every year, you will then create a home market for the farmer's product, you will bring it immediately home to your people in gold. Now I have no complaint to make at the decision of Judge Temple restraining the miner. It has always been the law that men must so use their own property as not to interrupt any other in the enjoyment of his. While the miner should be relieved from the opposition which surrounds him, the farmer should be protected in his rights. I went through the Sierra Nevada mountains twice during the last four years, seeing many of those people. I saw the miners there, some of whom I saw first when I was a boy; they passed my father's house on Bear river going into those mines. They were then young men, full of vigor and life; now they are old and gray and stooped. Well, they are sitting there between walls of gold, and cannot take it out. As your Governor has said, in my opinion there is no excuse for this Government not relieving the miners. The Government of the United States should come to the relief of the miner. It makes no difference how much money it takes—the appropriation is immaterial. I say to you now, that if I should ever take my seat in the national Congress, it would make little difference to me how much is necessary for the relief of the miner, I shall vote for him.

I have said to the people of the First Congressional District, and of California, that I had a theory upon which, and by which, relief to the miner can and will be secured. I want to state it now, so that if I am in error, I can be corrected by the press and by this convention. I say that the Government of the United States (while the Caminetti bill is a bill in the right direction and I have no criticism to make of it, because it is probably the best bill that could have been gotten at the time), I say the Government of the United States should make a sufficient appropriation to build dams wherever they are necessary, and to build them in such manner that they will stand and protect the farmer below and catch this heavy debris. Then, when this muddy water, which is detrimental to navigation or to the farmers below, flows over the top of the dam, that it should be caught up in flumes and run into the tules along the Sacramento, the American and the Feather rivers, and thus reclaim land that is unreclaimable under any system known to us now—fill them up and make thousands of acres of the best land in the State of California, at the same time driving out malaria along this ague-giving district. Now, I have a particular enmity existing towards fever and ague. I shook with the fever and ague five years on the Bear river, and I would like to vote for a bill to crush it out. Now, the difficulty, it seems to me, to a great extent upon this mining question, is that the people of the East do not understand us; they do not yet understand what California is and what she has got. They do not believe the stories about our climate; they do not believe the stories of our productions; they do not believe that we are separated first from them by a wall of gold, and secondly by a wall of silver. They think we are the biggest fibbers on the face of the earth. As an illustration of that, some time ago I was going from Yellowstone Park to Tacoma, and there were four or five young men from the East on the train. After talking together, and they said they were going to California and to Santa Cruz, and I said, "Boys, go and look at our big trees while you are there." I got on to an unfortunate subject. I said, "There is a church up at Santa Rosa built out of one redwood tree." They looked at me as much as to say that it was a pity that a man whose hair was as gray as mine should indulge in such statements as that. One of them was a photographer, and while we were standing out on the platform, he came up to me, snapped his camera, and said, "There, I have got you." I said, "Got what?" He said, "I have got the boss liar of the world." We want to educate the people of the South, of the East and of the North, that we are not constitutional liars, that we do not misrepresent what we have got, that we have got these millions of gold locked up, and there is no reason why they should not be unlocked, and I say to you that whatever ability I have will go hand in hand with this convention to unlock these untold millions of money.

The chairman proposed three cheers for Judge Barham, which were then given.

MR. FILCHER: Mr. Chairman, I would like to make a motion that when we adjourn for the noon recess we march in a body down Market street to the Palace Hotel, headed by the band. When we met last year we marched from there here in a body, but through some misunderstanding we were not able to do that this time. By marching back we will impress the citizens of San Francisco that we are among them and they will know there is such a thing as a Miners' Convention, and that will lead them to talk about this subject, to enlist them in our cause.

THE CHAIRMAN: It has been moved and seconded that when this convention adjourns for the noon recess that they adjourn until two o'clock this afternoon and that they march in a body to the Palace Hotel. The motion was then carried.

THE CHAIRMAN: Let me admonish you, gentlemen, that every one of you must be in line or he will be reprimanded.

We have a carriage here for the Governor to ride in, and if you will walk behind the carriage he will go.

There were cries of "No carriage."

THE CHAIRMAN: Governor, will you walk with us?

GOVERNOR MARKHAM: I will foot it as long as I live.

THE CHAIRMAN: The Governor says he will stay with us as long as we hang together. Shortly after the members of the convention, led by Governor Markham and President Neff, and headed by the Newcastle band, marched down to the Palace Hotel.

At the afternoon session Judge Belcher addressed the convention as follows:

On the 26th day of Novemher next ensuing, at St. Louis, will he held the Trans-Mississippi Commercial Congress, invited into convention hy the merchants of that city. The object of the congress is to discuss all questions affecting the interests of the people in that territory which may he the subject of legislation hy the United States Congress, and to express to it their resolutions and otherwise the sentiments of the Western people. It will also endeavor to take such steps for the presentation of its resolutions to that body as will commend to its attention and action whatever tends to promote the interests of the Western States and increase reciprocal trade among them, all of which come within the scope of its discussion.

I was asked to present this communication to this body, coming from the Trans-Mississippi Commercial Congress, and to suggest to this convention and to yourselves that within the province of this body, which seems to comprehend business or commercial organizations, that there he appointed from this convention three delegates to this Trans-Mississippi Congress, to meet in St. Louis on the 26th day of November next.

THE CHAIRMAN: This matter will be referred to the Committee on Order of Business.

The report of the Committee on Credentials was then read (see page 330).

The secretary then read the following:

Alameda county 15 delegates, Amador 36, Calaveras 17, Butte 20, Siskiyou 6, Trinity 5, Placer 96, Nevada 135, Shasta 10, Sierra 52, El Dorado 5, Mariposa 1, Kern 1, Mono 1, Yuha 24, Lake 1, Tuolumne 3, San Francisco 44, Santa Clara 4, Plumas 11, Madera 2, Alaska 1, State of Washington 1, Idaho 5, Montana 2, Nevada 5, San Francisco Chamber of Commerce 3, San Francisco Board of Trade 6, San Francisco Stock Exchange 3, San Francisco Technical Society 3, San Francisco Produce Exchange 3; total, 521 delegates.

On motion duly seconded and carried, the report was adopted.

It was resolved to appoint a Committee on Legislation of fifteen members, and one on Resolutions of an equal number.

In response to calls, Mr. Marcus D. Boruck came to the platform and said:

Mr. Chairman:—Probably I may put myself in communication with you hy saying, in my humble way, I have always been the friend of the mining interests of the State of California. My record proves that. While I have not, with the balance of you here, sought as much in the bowels of the earth for the production of the precious metal, not, in other words, being a producer, yet in the forty-five years I have been in the State of California I have been a magnificent consumer of the precious metal. I think it is fitting, as was well said hy Governor Markham, who has proven himself on more than one occasion to he your ardent friend, it is fitting that this convention should he held in San Francisco, as San Francisco to a great extent, more than can possibly he estimated in the few words that I will have the honor of presenting to you, is indebted to the mining element of the State for its great prosperity and for the most of its magnificent buildings which adorn our streets to-day. I said before that I have been a friend of the mining interests, and at the same time I have not considered it necessary to decry that other great interest which has assisted so materially in building up the State of California—I refer to the agricultural interests of the State. But we must recollect that the mining element, if I may so express it, had a preemption right to the State, in that the mining industry brought us all to the State of California. We did not come here to hunt the agricultural products of the State, for when the gold interests were first presented to the people of the world agriculture was not thought of in connection with it. But the foundation laid hy the miners of the State of California has built up that magnificent industry which has not only enriched the State but has enriched other States, and as is partially represented on that picture here to-night (indicating the picture over the stage), agriculture is indebted to the mining element for its great progress and success to-day.

Judge Hilborn, the newly elected Congressman from the Third District, then spoke as follows:

Mr. President and Gentlemen of the Convention:—I have not come here for the purpose of making a speech; I have merely come to listen and to he instructed. I heartily approve of the object of this convention. The country looks to the great West for advice upon this important subject of mining. No more important thing could be brought to the attention of the people at this time. If you can devise some means by which the product of the precious metals, especially gold, shall he so increased that the advancement in the purchasing power of gold can be arrested, you will give to the world the greatest hoon that it has ever received. The great trouble that confronts the world to-day is the fact that gold, the standard of value—the yard stick hy which the values of the world are measured—is being constantly lengthened. Any measures that may he devised hy which the money metals of the world can he increased, and in which the rights of all shall he protected at any time and place, in such measures you may expect my co-operation.

The secretary was then requested to read the communications, and he then read letters received from Congressman W. W. Bowers, Hon. J. E. Rickards (Governor of Montana), Stephen M. White (U. S. Senator from California), and James H. Budd (Governor-elect of California).

Lieut. W. F. C. Hasson read a paper on "The Use of Electricity in Mining," which will be printed next week.

THE CHAIRMAN: Mr. J. M. Wright, attorney, has been invited and has kindly consented to read a paper on "Object Lessons in Drift Mining." I take pleasure in introducing to you Mr. J. M. Wright.

Mr. J. M. Wright said:

Mr. President and Gentlemen of the Convention:—I was not requested to read a paper, hut to present a very few remarks with regard to the present operation of the law in relation to drift mining of the State. If I can hang this diagram, it will make the matter much more plain than anything I can say. (The diagram was held in view before the audience hy the secretary and an assistant.) Now, as you gentlemen cannot see the lettering on this diagram, I will explain that this lower portion, or the hrown, represents the hedrock; the green above is the volcanic capping. These little flags represent the division between the different claims; they may he of 20, 40 or 160 acres, as the case may be.

This yellow portion here represents a gravel hed running in this direction, this being a cross section of the country represented. Here is another gravel hed. Now, you gentlemen who are familiar with drift mining, understand perfectly well that the value of the property lies entirely in this gravel hed. There will he nothing on the hed rock lying hetween those two, everything having been washed down and carried through the gravel hed helow. Now, it has been ruled hy the Department, and it was ruled with reference to the very mine of which this is something of a representation; I can just state the facts as they occurred. Applications for patent were made. The matter passed the Land Office at Sacramento all right; it was then taken to Washington and the Commissioner of the Land Office ruled out one application, hecause he said there had been no discovery of mineral upon that particular claim. An appeal was taken to the Secretary of the Interior, and he ruled out two of the claims for that same reason. So the appeal resulted in the loss of another one of the patents. Now, the problem that is presented, and which should he considered hy the Committee on Legislation, is, How can the interest of the drift miners he best subserved? We have divers and sundry laws as to the quartz mines and as to placer mines, generally speaking, hut as to these drift mines which are located and patented under the patent laws, how can the interest of the drift miners he best subserved? That is the problem before this convention, and it will undoubtedly he presented to the Congress of the United States.

Now, rulings that there must he a mineral discovery upon each and every one of these claims, and that there he a mineral discovery upon this portion, (indicating,) or upon this portion, (indicating,) or upon this portion, (indicating,) as you will all see, the mines will he worked out hefore patents can he granted at all. Where the rock has nothing hut a volcanic capping, it is of no value to anyhody in the world except the drift miner.

Now, it seems to me, and I think it will appeal to all of you, that some law should he devised which will give the drift miner a show. He does not know where his claim hegins; whether the valuable lot will lie under this claim, or this one, or this one, (indicating.) Now, in this case, this work is being done under the supervision of Mr. Chappellet. Here is his gravel hed. When he starts in, he can reach no gravel, he can reach no pay until he reaches this gravel hed. Of course, there is a presumption that there is a gravel hed here, (indicating,) but he must pass through all this vast space of ground hefore he can reach this gravel hed. This depth represents 750 feet, here 800, here 525, here 500 and here 400 feet. (Indicating.) Now it seems to me some statute should he passed that would give the drift miner a chance, not compelling him to show mineral upon each and every one of his locations, but certainly in those cases where the ground is composed of nothing but the volcanic capping, and with the chance to pursue his explorations. But where mineral is discovered in the immediate locality, where one of his mines has been shown to he mineral land, then he should have a chance to hold it, if not by patent, by clear title recognized until he can make his explorations complete, and until he fully explores this ground. The vast amounts of money necessary to be expended in the explorations, you gentlemen all appreciate. You know that not one man in ten of those who are now willing to engage in drifting mine would consider the subject for a moment if they were compelled to make these haphazard explorations, without any hope of holding the ground, after making the exploration. At this time I will not make any motion to the judgment of the convention, but I make this report, with the few remarks I have, which may make clear what I desire to have presented.

Now, gentlemen, there is one other matter which I have not been invited to speak upon, but which I desire on my own account to present to your minds, it being a subject with which I am more or less familiar. You gentlemen have had presented to your minds by various speakers, and by the various articles you have read in your mining journals, the fact that everywhere throughout the mining countries, the Courts have decided against the mining men and in favor of the agriculturists. Let us take for instance, the great question of water. It is perfectly fresh in the minds of every one of you how the great fight hetween appropriation and riparian rights in this State went on a few years ago, and the old common law determined in favor of riparian rights as against the law of appropriation. Now, far he it from me, as an exponent of the law, in my humble manner, to say one word against that great monument to the intellectual power of the English speaking race, the common law, but it seems to me, in this one particular, and its applications to the mines of the country, the common law does not go far enough, it is not flexible enough. It seems to me that in this country where water is absolutely necessary to the development of your mines, and where it is necessary to the irrigation of your lands, that the law of prior appropriation should prevail, against the law of riparian rights. I only speak of this by way of illustration.

When you come to the question of quartz mines, which I am now approaching, the common law, as you are well aware, gives every man everything that lies upon the top of the soil he owns to the heavens and to the center of the earth beneath. The lines are drawn down vertically to the center of the earth—everything within those lines drawn down vertically belongs to him. Gentlemen, you may not he aware of it, but in your mining industries and mining courts, the intendment of the law is held to he in favor of that as against your ownership of the extra-lateral portions of the lode you locate. There should he provisions in your statutes to the effect that all intendment should be in favor of your ownership and holding of your extra-lateral rights. For instance, only a few months ago—I think it was in the month of April or May, 1894, after the mineral courts had settled the question regarding the ownership of extra-lateral portions of mining lodes, so that nearly all of the mining lawyers throughout the United States were satisfied with the then condition of affairs—the now celebrated Amy case was decided by the Supreme Court of the United States, and there it was stated that wherever the line crossed the course of the strike of the lode, that made an end line. The question was then raised, How is it where one end line crosses a lode, and one side line crosses a lode? The har of the United States had been divided upon that question. If each one of those lines crossing a lode is an end line, then a miner might have 1499 feet of a lode within surface lines, and if it passed out one foot hefore it reached the end of the line, he would have no extra-lateral lodes, and no matter what expenditure he put upon his lodes, he would he at an end the minute he reached his surface lines. I think this question should he settled for all time, and that these questions should he settled by legislation; first, as I said a while ago, an intendment should he in favor of holding and ownership of extra-lateral lodes heyond your surface boundaries, and the mineral of said holding should he protected hy statute, so that from this time forth, after twenty-two years of litigation, since May, 1872, when a man locates his lode he knows what he has got. It is the certainty of yo rownership that makes it valuable to you. You are not willing to put $10,000, $20,000, $30,000, $40,000 or more thousands into the ground, so long as you fear that next week or next month, or any time afterwards, it may he taken from you by those who claim your lode on its downward course. What you need is a clear and explicit definition in the statute itself, and if I may suggest to the gentlemen who may compose the Committee on Legislation, in my humble opinion, the law as it stood—I am looking straight at you, Mr. Ford—the law as it stood after the decision of the Amy case hy the Supreme Court, is the one that is fair and just to the miner—to all of them. I helieve the determination of the Amy case, as expounded hy the Supreme Court of the United States, is what the miners want, and I helieve every mining lawyer within the sound of my voice, and that every miner who understands it, does likewise.

THE CHAIRMAN: Gentlemen of the convention, Senator Ford has been invited to address the convention upon the question of hydraulic mining and legislation in regard thereto.

Senator Ford spoke as follows:

Mr. Chairman and Gentlemen of the Convention:—The committee having in charge the arrangements asked me if I would prepare a paper upon mining legislation, State and National. I told them I would do so if I could find the time. Unfortunately for me, probably fortunately for this audience, I have failed to find any time at all. My own poor affairs somehow happen to take up my time, and I have no paper to read to you. But, being somewhat familiar with legislation on mining affairs, I will just briefly, probably somewhat disconnectedly, say something about mining legislation. You all probably understand that there has been less legislation upon the mining question than probably any other question that concerns the welfare of California.

The State of California, through her Legislature, prior to the organization of this association, had contented herself with simply adopting the rule that the local customs and regulations of the diggings should control in all actions relating to mining claims, and Congress, prior to 1866, has enacted no law, and has up to this time enacted no law—or at least prior to the organization of this association—except a law, the one of 1866, which was enlarged upon in the Act of 1872, which acts did but little more than to legalize what had therefore been a trespass and render lawful the regulations and customs of the miners and provide a means whereby the miner could obtain title to his property. It is a matter of history that these customs, rules and regulations of the old pioneer miners have stood the test of time and have proven themselves to have been the most just and the most sacredly revered of any laws that we have to-day in California. That spirit of fairness guided those noble men who came here in those times—those men who went up into the Sierra Nevada mountains and through the hills and mountains of this State and smote those one time silent hills like Moses of old, and caused streams of gold to gush forth into the channels of commerce, which quickened into life this commonwealth.

Those customs and regulations were born of a peculiar and anomalous condition of affairs. They were born of a necessity to provide laws to meet new conditions surrounding the miners. Those are the laws and customs which have, so far as legislation is concerned, governed the mining industry of this State. The great hulk of the law concerning mining has been built up by the rulings of the court and decisions of the Land Department. Through the decisions of the courts, which were founded upon these old-time regulations and customs, a code of laws came into effect, which began to be demonstrated throughout the State. The time arrived, however, when the surface placers were worked out and deep channel mining hegan to he conducted. Then, some years ago, we came in contact with the valley people, who desired to preserve the navigable streams and lands adjacent to them. You are all familiar with the struggle which finally ended in the famous Sawyer decision, and the monitor was for a time hushed. Then came discussion among our people and a desire to avoid the damage that we had unfortunately inflicted upon the navigable stream, and it became apparent to the people of this State that the gold in these hills was an absolute necessity to commerce. The Legislature had been against us, the sentiment of the State had been against us; the idea prevailed that the mining people had no regard for the law and that they were regardless of any damage they might do so long as they were permitted to conduct their own business. This position, regretful as it was, became a State opinion, so to speak.

Finally, however, it began to dawn upon our people that we miners were a pretty good sort of people after all; that they did not all wear pistols in their helts and knives in their hoots. There finally came a time when the Governor of this State, in his inaugural message,

said to the people of the Legislature and the people of the State: "Something must be done to help our mining friends." Governor Markham, be it said to his credit, has the courage to say to his people that hydraulic mining could be resumed without any damage to other interests, if the proper engineering skill were brought into requisition. He said to the Legislature and again to President Harrison when he met him at the State line: "Sir, if these gold fields were in Russia or Germany or France, those nations would see that the gold came out of the hills to flood the channels of commerce and help along the industries of the country." That was the beginning—that was the touching of the button. Governor Markham touched the button, and we must do the rest.

From that time the sentiment has been changed so that our appeals to Congress have been listened to with more respect. Our appeals to the Legislature have been met with most warm welcome. The Senators and Assemblymen of the Legislature did nobly for us miners; but first let me suggest briefly the plan of campaign that was outlined in so far as hydraulic mining was concerned. That is only one branch of the work of this association. It was determined that there was a solution to that question and that solution was this: In the impoverished condition of the miners, and in view of the fact that vast neighborhoods have been depopulated, the monitor silenced, millions of dollars worth of property destroyed, schoolhouses and churches swept down stream, we realize that some help must come from State or nation, and the theory was that, as the Sacramento river was a navigable stream, and needed protection, and that there were millions of pounds of debris in the tributary streams already brought there from causes not wholly mining, that California must undertake the work of protecting its navigable streams. The engineers agreed that one remedy was to impound in the mountains at proper places, under the supervision of the engineers, by means of restraining basins and dams, the debris that came down and would otherwise reach the navigable streams. While doing this, it would be an easy matter to also take care of such further tailings as might be sent down by the miner. It was a plain, simple feasible proposition. The engineers told us it could be done. It has been done in France at the foot of the Alps; the dykes of Holland is another illustration. There was a feasible solution of the question.

In order to carry that plan into effect, it was necessary to reach Congress. The last State Legislature, acting upon this plan, passed two bills—one defining hydraulic mining, and the terms by which it would be carried on, namely, that it could be carried on whenever and wherever it could be carried on without material injury to other interests. Then the next proposition was to make it possible for the miner to comply with the proposition. The way to do that was to furnish the necessary funds to build the works. The last Legislature then, following up the first measure, passed a second one appropriating $250,000 for the erection of such works as should be used in restraining the debris from the mines and whatever debris is there now, upon condition that the General Government provide at least as much for the same purpose. This would make us a fund of $500,000, which would go a long way toward settling that proposition.

Only a few days ago I was talking with an eminent engineer, and he told me that for less than $500,000 he could construct a dam on the narrows of the Yuba river, 250 feet high, if need be, that would hold back all the debris the miners could send down from the Yuba watershed.

This much has been done: California has sent her messenger back to Washington and said to the General Government: "While we cannot undertake this work alone, California cannot ask you to do it alone, and we will help, but your help we want. It is true, Congress has lent us a favorable ear, and recognized our claims, but has not as yet seen the way clear to do just as we want. We have, however, much hope for the future. We have hope that the agitation which has gone on and has gradually educated our people to this fact, which has really stood in our way to a great extent—our valley neighbors heretofore have failed to realize that we have no desire on earth to injure them—that if we can take them by the hand and map out some plan that will protect their navigable streams and adjacent lands, and at the same time let our mines go on, that is what we want to see. The miners are perfectly willing this matter should be left to the skill of American engineers. We know it can be done—we know it is being done to-day in the mountains under the Congressional Act under which the Commission has been appointed, but it is being done in isolated cases, and no general revival of hydraulic mining can take effect until this assistance from Congress can be had. When that is done, aided by a stream of gold from our own State treasury, you will hear once more the songs of prosperity ring from the mountains and streams of gold rush forth into commerce to quicken the life of California, and guard and protect us against the hard times that come to us from Eastern States."

There is one other piece of legislation that is highly desirable. Mr. Wright has very clearly and forcibly explained to you the necessity of Congressional action that will enable our drift miners to feel more secure in their titles to their claims prior to obtaining title. This is a matter that has engaged the attention of the Association. A bill was drafted, covering the points suggested by Mr. Wright, and sent to Congressman Newlands, he being the only member from this coast on the Committee on Mines and Mining.

At the same time a bill was introduced by Senator Stewart in the Senate and by Mr. Camiuetti in the House. I will not trespass upon your time by telling what has been done with all these measures, for the Committee on Legislation will probably report concerning them. These matters are well in hand, and we hope at the short session of Congress this winter to so amend the Stewart bill, which has already passed the Senate and gone into the House, as to incorporate in it the ideas suggested by Mr. Wright and others.

In conversation with Mr. Newlands, he told me that it was absolutely necessary, or at least highly important, that we should have some one there at Washington this winter, if we expect to accomplish anything in the line of legislation during the short session. I agree with Mr. Newlands in that matter, that if we can find some one who will take the time to go to Washington, who understands this matter, and will present it there, answer all questions that will be asked, it will aid us materially in this matter.

There is another phase of this matter which does not concern legislation, and that is the great good this Association has been to the mining industry through this State, by way of advertising it. About two years ago, before the celebrated inaugural address of Governor Markham, which started all this thing going, and opened public sentiment—and we ought to be extremely grateful to him for it—prior to that time, throughout this country and throughout our own State, it was generally supposed that the mining industry had about died out, that there was really little left of it, that the gold fields were about exhausted. Now the whole country is alive to the fact that there are vast gold fields in California. More developments are going on in the Sierra Nevada mountains than for ten years past, and I say this Association, with the impetus given to it by the Governor's inaugural address and the energetic work done by the officers of this Association, has brought about this condition of affairs, and it rests with us to keep the good work up. Keep pegging away at national legislation, knocking at the doors of Sacramento, keep up the agitation, agitating among ourselves. The way to get a thing is to keep at it until you get it. If we keep on agitating this question, send a representative to Washington, urge upon our Congressmen the necessity of doing something for us, we will accomplish all we deserve to accomplish, and will deserve the thanks, not only of California, but of the entire nation.

MR. THOMAS (of Alameda): Mr. Chairman, I move a vote of thanks to Judge Hilborn, Mr. Wright and Senator Ford. This motion was duly seconded and carried.

MR. WRIGHT: Mr. Chairman, while Mr. Ford was on the floor I was desirous of asking him a question. I think this convention knows a good thing when it has it, and I think Mr. Ford can give us some further information. I would like to ask Mr. Ford what is to prevent the carrying out of the debris down upon the swamps of Yolo county, as suggested by Mr. Barham this morning. I spent ten years in New Mexico and came back to California after this war was over between the miners and the farmers, and I heard of those banks of debris and made a trip up in the mountains. I found there were vast expanses of swamps that needed this debris. I would like to know why it is not carried onto them.

SENATOR FORD: In reply to that I would simply say that the miners are not particular about the details of this matter. The Federal engineers say they can do it. They say to us, "You get the money and we will see that the works are constructed." I am not an engineer and do not understand this question very well, but the engineers say they can accomplish it. If it can be done by running the debris on the tules, or by running the tailings into the American basin very well. I should have referred to that in my talk. The detail must be left to the engineers.

THE CHAIRMAN: I will state for the information of the convention that Mr. Rose, Commissioner of Public Works, has been invited to address this convention. He has a plan that he submitted to the Executive Committee some time since, and he will undoubtedly address you upon that subject. There has been another gentleman invited to present his views to this convention on the question of "The Department Rules for the Miner"—Mr. A. H. Ricketts.

The paper by Mr. Ricketts is given elsewhere in the PRESS.

THE CHAIRMAN: The chair will announce the Committee on Order of Business, so that they may have their report ready to-morrow morning as the first order of business.

The secretary then read the following as the Committee on Order of Business: Julian Sonntag, chairman; H. T. Power of Placer, A. Tregidgo of Nevada, Grant I. Taggart of Alameda, R. H. Campbell of Siskiyou.

On motion, duly seconded and carried, a vote of thanks was extended to Mr. Ricketts for his able paper.

On Tuesday morning, after the Committee on Order of Business had reported, the chair announced the following committees:

Committee on Legislation.—Tirey L. Ford, E. A. Belcher, J. M. Wright, Chas. G. Yale, A. H. Ricketts, R. McMurray, J. B. Treadwell, Thos. G. Merrill (Montana), E. W. F. Deal (Nevada), W. W. Kellogg, H. N. Riordan, Ira Hill Reed, C. C. Bush, J. F. Townley.

Committee on Resolutions.—E. E. Voorhies, C. W. Cross, S. B. Christy, J. J. Ives, W. R. Thomas, A. Ekman, T. T. Lane, T. H. Leggett, Fred Searles, John Spaulding, James Bryan, J. E. Lyons, T. C. Loftus, J. M. Walling, W. E. Sharon.

The committees withdrew to attend to their duties, and Senator Geo. C. Perkins was introduced, and said:

Mr. President and Gentlemen of the Miners' Association of California:—I congratulate you, gentlemen, upon having met, as you have in this convention, for the purpose of reconciling differences, if any now exist, between the agricultural and mining interests of our State—for certainly they should go hand in hand together in developing our great resources. There can be no antagonism between these great interests any more than there can be in the mercantile and manufacturing interests. But the way to reconcile these differences is to do just what you are doing to-day in this convention, by discussing the various propositions. Why, our Government is one of discussion, and there is scarcely a law to-day upon our statute books but what has been the outcome of argument and discussion, and so it is with this mining, this debris question.

We would have had no California, no golden city of the West, had it not been for the mines of California, and for the enterprise and the energy and the explorations of the miners that have developed the great mineral resources and given to the nation, to the world, $1,400,000,000 in gold alone. And to-day, when every other interest in our State seems to be prostrated, no profits in commercial business, in manufacturing or farming, yet the miners of California are bringing forth from the hidden treasures of the earth over a million dollars a month in pure gold and putting it in circulation, giving employment to tens of thousands of miners and to thousands of machinists.

But not only the golden interests—we have great coal interests, we have chrome ore, we have lead ore, we have silver ores in California, and, what is more, within the past year you are developing a great oil interest. One mining company alone in this State is producing 20,000 barrels of oil every month, and it is capable of increasing this, I believe, until the output can be 50,000 or 60,000 barrels of petroleum monthly. While we are digging gold, petroleum is the twin sister to gold, for in it we have the fuel that evaporates the water and makes the steam and runs the engine that pumps the water out of the earth, and so giving employment; and so together we should go on developing these great interests. In every county of this State there are minerals beyond enumeration that only want to be brought to the surface, smelted, remelted into different form to make serve it in the great mechanical and commercial world.

While the convention is in session I hope you will give expression on the silver question. While California, perhaps, does only produce about $5000 in silver—during the past year—yet we have mines in San Bernardino, Inyo, Mono and other counties in this State that rival in richness those of Arizona and Colorado, and I believe this convention should declare for an American policy on the silver question. While many of us may believe it impolitic to open our mints to the unlimited free coinage of silver from other parts of the world, from Mexico, from South America and Central America, there can be no question, in my mind, as to an American policy that opens the mints of the United States to the products of the silver mines of America.

Your president and myself remember the time when we first owned the rocker; we thought that was mining on a large scale; when we came to the Long Tom and commenced shoveling dirt, that was making splendid progress, and when he came one day with a pair of gum boots without soles he said. "I have a new plan for saving the gold: I will have sluice boxes," and he was shoveling it up with one of Angel's old shovels that did not build the Union Pacific. Later on we got the cost reduced to seventy-five cents and we thought we could progress no further.

Later on, he found a hydraulic, and he says, "Perkins, I am hydraulicking this down for one and a half cents per ton. That beats the world." The judgment day was near at hand. And so he succeeded in taking out his wealth. Like most of old Californians, he is distributing it among the people—they never keep it, you know. And so this State of California owes her greatness to-day, in great measure, to the pioneers of California, for I venture to say that statistics would show that prior to 1885, ninety-nine out of every one hundred people who came here were attracted by the gold mines of California. While we have developed all these great agricultural and manufacturing resources of our State, our mines have just commenced to produce, and I believe, going on as you are progressing, in the past few years by these appliances, that the product of California, instead of being $12,000,000 or $13,000,000, will in three years be $25,000,000 per annum. It depends upon you, gentlemen, by your wise, your judicious deliberation—it depends a great deal upon you, what you will do to stimulate this great industry, with malice toward none, with kindness to all, believing that the agricultural interests are the miners' interest, I feel confident that you will recommend such legislation that cannot fail to be protective to the best interests of this State.

Three cheers were then given for Senator Perkins.

Thos. J. Clunie, on being introduced, said:

Mr. President and Gentlemen of the Miners' Association of California:—I can assure you that I esteem it a great honor to be called upon to address such a distinguished assemblage of gentlemen as I see before me to-day. I see before me my friends who have helped to carve the destinies of this great State, and, as was well said by Senator Geo. C. Perkins, they were attracted here by the gold developments of California. It seems to me, my friends, judging from the conditions that exist to-day, we are returning to first principles. We are getting back to hauling fruit from Fresno in the old primitive way, and we are returning to the collection of gold that made this State famous the world over.

Some years ago I had the honor of representing this State, in part, in the United States Senate. A bill was introduced there for the purpose of building dams to restrain the debris in the mountains. I examined the bill, and I believed it to be crude, and I did not think it would further the interests of hydraulic mining. I opposed it, but when it came to the General Government taking hold of this subject, I stood in to the full extent of my ability. I realize, my friends, more than ever to-day that if this State where I was reared—a State that we all love—should continue to prosper, we have got to return to the mining industry as the chief of all.

Mr. President, that is a pretty picture there before you. But I know that there is a gray cloud that you see in that part of the picture have ceased to pay the farmers of this State. You and I know that it is impossible for them to raise grain at the present prices and make a living; that they are going in debt day after day; that enterprise and energy of the entire State is prostrated. But the old pioneers of 1849 and their children to whom they have transmitted their energy and indefatigable will are again coming to the front. You say the people are with you. Of course they are with you; why should they not be with you? They realize that they cannot get along without you. I was reared in the Sacramento valley, the place where the injury was done through hydraulic mining, and I think if they had to do it over again, it would be better to sustain the injury and let hydraulic mining go on. But we have found a way, my friends, in which no industry can suffer. We have found a way, reported upon by the men who excel in engineering. They tell us that the debris can be impounded and the gold that lies hidden in your mountains can be thrown into the lap of the nation. Why should not this receive encouragement? You and I know that in the dark days of this country, when we did not know whether our Government was to be maintained or not, it was the gold dug from the mines by the California miners that maintained the credit of this nation. It is the gold that you can dig now that will maintain its credit. Fourteen hundred millions of dollars, Mr. President, have already been taken from our mountains in California.

More than that lies hidden there now, waiting to give you an opportunity to take it out. Suppose you had fourteen hundred millions added to the monetary system of this nation; would there be any need then for an issue of gold-bearing bonds? Would you not be able to take care of the silver of the country? Would you not have gold enough to maintain the parity between gold and silver if they would let you take it out of the mountains? I say to you, my friends, referring to the suggestion of your president in regard to appropriations that we have not been fairly dealt with, this great State has put into the coffers of the nation for many years no less than $16,000,000 annually, and in return for that, my friends, you have received a hare, beggarly pittance in the way of an appropriation.

I ascertained that in the war times, when the lamented Lincoln presided over the destinies of this great nation, that he called upon California—he called upon her people and its Governor. They responded to the tune of millions of dollars, taken from our State treasury, and given to the nation to be returned at the close of war. I found out that upwards of $3,000,000 had been advanced by this State for that purpose, and that not one dollar had been returned to the public treasury. I gave a year's time to that, my friends; we went all over the vouchers, and every public official that examined them, agreed that they owed this State upwards of $3,000,000 not counting the interest. I prepared the bill. It was submitted to the committee. They could not get around our evidences, and they unanimously reported it. It was on the calendar. I had the word of Speaker Reed, that I should be recognized to take it up, (and he never told me a story in his life—I have a great deal of respect for him), and he called me up and said, "Clunie, I cannot let you take that bill up. We have figured up our appropriations, and they are already immense. That has got to go over to another Congress."

My idea was to make a practical suggestion to you people, not that I can tell you how to mine, for I am not a practical miner, but I know something about the making of laws. I understand that what you want is the ways and means to get the work started and to go on with it. My idea was to get the Legislature of this State to pass a joint resolution, saying to Congress that any money that is appropriated for the Sacramento, the Yuba and San Joaquin rivers, and for the purpose of building dams, that that may be credited on the amount of money they owe us.

In other words, they concede they have borrowed upwards of $3,000,000 and for thirty years have refused to pay it. If the people say to them, "You give us that money in order that we may pour into the lap of the nation millions of dollars to add to the wealth of the country and credit it upon the amount that you owe us, can there be any objection to that? This State has appropriated $250,000. It is lying there waiting for the General Government to appropriate a like amount. But they say, "We cannot appropriate money to build dams; we cannot help the miners in California. They must paddle their own canoe as the people of Maine and Georgia do." Of course we are all united on that subject. They say: "We cannot take money out of the treasury for that purpose." But if you say to them, "You are doing the nation a favor, and it is not costing you one dollar to do it," I believe you could get the appropriation. I believe that if you back Mr. Caminetti up he will get the $250,000, and it will be credited on the debt that the Government owes you.

Now then, so far as the appropriation for these rivers are concerned, when you get four or five enterprises going on in the State, the harbor at Eureka and the harbor at Oakland, and when they go down to Santa Monica and try to find another harbor there, and you get a law made for this particular purpose, it is charged to this State, and you cannot get appropriations for the rivers, and I would fight any new proposition that did not let you fix these rivers and impound your debris in order that this mining may go on.

The only way, in my judgment, is to have the Legislature of this State pass a joint resolution saying, "We want the money you owe us, and we authorize the Government to credit this on the amount of money that it owes." This is practical; it is common sense: it is decency; it is justice; it is right, and it can be maintained anywhere.

Now, gentlemen, I want to say to you that I am heart and soul with you in your enterprise, not particularly because I love you any better than I do anybody else, but I love this State and I believe that its material prosperity depends on the success of this organization.

Three cheers were given for Thomas J. Clunie.

Hon. T. G. Phelps was presented to the convention, and said:

Mr. Chairman and Gentlemen of the Convention:—I feel a great deal of embarrassment in appearing before you at all—you gentlemen who have given so much more thought to the questions affecting the mining interests of California than I have had occasion to do. But I think I can say this, that the almost unanimous interest of the State of California to-day is in favor of the mining industry. And that any legislation which you may desire, either from Congress or from the Legislature of this State, not prejudicial to other interests, will be accorded to you. I believe that every safety shall be given to the miner in his hazardous undertaking. I believe that if he is not now in law protected, he should be protected in following his lode to the center of the earth, whether it takes a vertical line or whether it goes off at an angle. Furthermore, he should be protected in his holdings; no land should be transferred by the Federal Government to any person or corporation which, though it may not show gold on the surface, is known or believed to contain gold in the depths. The miner should be entitled to prospect the whole country and avail himself of his discoveries wherever they may be.

I agree with the able gentlemen who have preceded me, that our languishing industries demand the development of the mining interests of this State. We want to see the Sierra Nevadas again repeopled. We want to see 50,000 miners at work, which means a population of 250,000. Now, this 250,000 people are worth more to the agricultural, mercantile and manufacturing industries of this State as a market for our products than is the commerce of any single country under the light of the sun. It is that market we want. Aye, we want more; we want the gold that you will produce to relieve the avenues of commerce; we want it not only to stop the further issue of bonds, but we want it to pay our obligations, and when they are paid, we will see to it that we keep some of it at home.

Governor Perkins and Senator White, during the last session of Congress, sought to, and did, so far as the Senate was concerned, secure an appropriation for the building of debris dams, but it was stricken out in the House. This is an appropriation which the Federal Government owes us. It is in the interest of the Federal Government to make it. But, if she will not do it, we will do it ourselves.

MR. TREOIDGO (of Nevada county): Mr. Chairman, before adjourning, I would like to offer a resolution. There have been some very important papers read before this convention, and as the delegates here present only represent one in ten of this great Association, I move that the transactions of this convention be printed in pamphlet form, and that a number of the pamphlets be sent to the secretary of

(*Continued on page 333.*)

Mineral or Agricultural Character of Land.

The following argument is respectfully submitted by the California Miners' Association to the Congressional Committee on Mines and Mining in support of a section of the Newlands bill relating to contests between mineral and agricultural claimants of land.

TIREY L. FORD,
E. A. BELCHER,
CHAS. G. YALE,
Committee on Legislation, California Miners' Association.

The proposed ammendment to section 2335 of the Revised Statutes of the United States relating to mineral lands, contains a clause which reads as follows:

"That in investigating the character of the land with a view to ascertaining whether it is more valuable for mineral than for agricultural purposes, evidence may be taken of the mineral discovered or developed adjacent to such land, proof of which shall be presumptive evidence that the land in question is and always has been mineral in character."

It is to be noted that the paragraph in question does not designate such land as mineral as may have adjacent to it discovered or developed mineral, but merely that evidence may be taken that there is such mineral adjacent. If this be proven it is then to be taken as *presumptive* evidence that the land in question is mineral in character. There is nothing unfair in this to the agricultural claimant, since common sense would show that with discovered mineral adjacent such land would naturally be more of a mineral than an agricultural character. The miner must prove that there is discovered mineral adjacent to his claim. It is clearly the intention of the Government to reserve mineral lands for miners, but without some such provision agricultural claimants may, and do, take up homesteads right between two developed mining claims, and the contesting miners have no chance to prove the probable existence of mineral on the tract in question, though the existence of the other claims is clear evidence of the miner's presumption.

As it is, under present conditions and rulings, large tracts of mineral land are passing annually from the domain of the miner and prospector into private hands for which the Government never intended them. Each year sees more restricted those areas within which the prospector may search for mineral; and he sees taken from him, for half the price he is willing to pay, ground originally set aside for him by the nation. Countries of older civilization than ours, better realizing the value of the mineral resources, throw every possible safeguard around the mining territory and in every way assist the miner and prospector to discover and develop it. Here, he must not only contend with the manifold obstacles connected with the work of prospecting and developing claims, but has a more difficult task still in fighting for his rights in opposing "regulations of the Land Office" and "decisions of the Secretary of the Interior," written mainly by clerks who know nothing about mines and mineral lands, and promulgated and enforced by ephemeral officials with no direct interest in or practical knowledge of the subject.

While the prospector or miner sees that the Government places double the valuation upon the mineral that it does its agricultural land, and that it quadruples the expenses and difficulties of acquiring title to the former, he finds it difficult to comprehend why all the rulings and decisions of the departments of the same Government favor the agriculturists as against the miner and permit them to readily acquire lands manifestly intended for him. He does not go into agricultural regions to prospect, for reasons which are plain to him and should be to every one; but he finds agricultural claimants coming into what is clearly and manifestly a mineral belt and easily becoming possessors of mineral-bearing ground for which he is himself unable to obtain title, unless by long and expensive contest. He is met by so many palpably absurd and unjust rulings and decisions, which apparently evade the mining laws, that he at last realizes that these laws are themselves defective or incomplete when they permit this. It becomes evident to him that the Government does not as yet realize the injustice it is doing, not only to his class but to itself, in allowing the mineral lands of the country to pass into the hands of those who cannot utilize them, but hold them at greatly advanced prices to sell to those for whom they were originally intended.

The fact that the ground in dispute is on a well-recognized mineral belt, with more or less developed mining claims adjacent, is not considered under present conditions; but if the proposed amendment becomes the law, evidence that there are other mines in the neighborhood would have to be admitted and the Government would get $2.50 or $5 per acre for land it is now generally selling for $1.25 per acre, and the miner would have his rights protected.

The miner cannot well spend money developing ground for which he has no title; and he cannot get title until he does develop it, since he cannot comply with the present laws and prove it valuable without such work. That this system is a manifest absurdity is apparent. Agriculturists are not required to prove that the land is fit to raise a crop of any kind, and that, if it can, said crop will be valuable. But the miner must prove, before he can do any work on his claim to get title, not only that there is mineral, but that the mine is valuable. There are numerous instances in all mining regions where many thousands of dollars have been spent on a claim before it is found to have no value, or to be valuable. This is one of the practical features of mining which the law fails to recognize. Under the existing practice in investigating the character of land before the U. S. Land Offices the miner is required to prove that each twenty acres of a placer claim contains mineral in sufficient quantity and of such a quality that it can be profitably worked. This is often impossible for the prospecting miner, who is the original claimant, to do.

He is usually in poor circumstances, living on such inexpensive food as he can carry with him in the mountains, the hope of realizing his dreams and finding a rich mine being all that spurs him on.

The prospector is usually an energetic, intelligent and experienced miner who is so far above his class that he only works long enough for the owners of developed mines to enable him to accumulate sufficient money to pay for the plainest kind of necessities for his intended expeditions. The probable boundaries of the mineral regions are easily discernible to his practiced eye. He does not go down into the valley lands, nor does he prospect the foothills where it would be impossible to search. He confines his operations within the recognized mineral belt until he comes to some developed mining claim. It is in country adjacent to such claims where he is most likely to find mineral ground. He makes inquiries for the boundaries of any such claim, which must be marked on the ground "so that they can be readily traced," finds them, and then searches for a piece of "vacant land," that is, a piece not already "claimed" by some other person, on which to make and mark his "location."

He is guided in this to some extent by what he has observed in the mine in operation and commences his prospect shaft where his experience and intimate knowledge of information, etc., tell him he will be apt to find the continuation of the vein or lead of mineral or the gravel channel which is being developed on the adjacent land. This is no guesswork with him. If he is sufficiently skilled and finds some place in the vicinity where the indications are favorable, he begins work.

If in his judgment he has found a payable lead and made what is called a "discovery," he proceeds to make a location in accordance with law, with which every prospector is more or less familiar.

On unsurveyed land he can work off the boundaries of a placer claim in any direction, no matter how irregular, because the miners who drafted the original laws know that those placer deposits were so irregular that they could not in justice be limited, except by area, and the walls or sides being vertical made it fair for all.

The clerks of the Land Office, for no other apparent reason than to make it easier to draw them on the public land maps, have tried to confine "placer locations" to rectangular subdivisions when on "surveyed public land," an injustice which some considerate person has qualified by inserting "as near as practicable," in the statute.

Whether it be a "placer" or a "lode" claim he marks it out on the surface, writes out a "notice" describing the location, and putting one "notice" on the "location" he takes a duplicate to the proper "Recorder" and records his claim in accordance with law.

Now his real trouble begins. The fact of his "recording" his location has been noised about and drawn the attention of curious or interested parties in the vicinity to his "find," who thereafter keep a close watch on his proceedings, and if his "prospects" improve, they, with the instinct of greed common to men, set about to reap a benefit to themselves by taking advantage of his industry.

There are several ways of accomplishing this, but the one most in vogue is the "agricultural claimant" game, to protect him from which is the object of the clause of the proposed amendment to Section 2335.

This is an ideal case, but as will be shown further on, by extracts from the local U. S. Land Office, it is a "game" which is being systematically played to the very serious detriment of the development of our mineral resources.

The population in the mineral belt and in the close vicinity of the developed mines has been attracted there by the demand for labor created by the operations at the mines and the opportunity offered for supplying the necessities of the laborers and their families.

It is in no sense an agricultural population. Cereals cannot be successfully cultivated, on account of the altitude and the extreme roughness of the face of the country.

Patches of alluvial soil a few acres in area are found in the beds of the ravines, on which can be raised a little hay and some vegetables and fruits, sufficient perhaps for the local demand, of such varieties as the altitude will permit.

These people, honest and respectable in all other respects perhaps, have become so accustomed to this "agricultural claimant game" from the ease with which it is played and the immunity from punishment in similar cases with which they are familiar, do not hesitate, when one of their number makes a "homestead location" on such legal subdivisions of the public land as will cover our prospector's mineral location, to accompany him, the homesteader, to the proper Land Office as witnesses and swear that they believe that the land applied for as a homestead is "more valuable for agricultural than for mineral purposes." Being entirely ignorant of mines or mining, it is quite easy to swear to a negative proposition.

The expenses of these witnesses amount to a considerable sum, but as they are all residents of the same community and will require similar services for themselves sometime, they are cheerfully met.

News of this homestead filing reaches our prospector, and if he has any money left he travels to the Land Office, fees an attorney and files his protest in due form.

A "hearing to establish the character of lands" is ordered and the miner is obliged to show, not that —— land in the neigbborhood is mineral (and theoretically the land in dispute must contain mineral), but that the particular piece in question actually does produce mineral. Proof that the land is of little agricultural worth is not satisfactory to the Department; and, further, it has been required by the Land Offices that the claimant must prove the mine to be a valuable one. That it is impossible for the miner to prove this without great expense in sinking shafts and running tunnels, is self-evident.

Therefore, the bearing results, from the preponderance of evidence on the "homesteader's" side, in a tract of 160 acres of land, well known from its surroundings to be valuable mineral land, being awarded to the homestead claimant when it is equally well known that he does not intend to cultivate it and would never have dreamed of possessing it if he did not intend to sell it again at an increased value as a mine, or perhaps to hire this unfortunate prospector to work it for him at current wages.

The injustice of this is apparent, and to prevent it and give something like fair play to the mining interests is the object of the proposed amendment.

A law that evidence that mineral has been discovered or developed in adjacent ground shall be prima facie evidence that the land in question is mineral and always has been, will effectually prevent these barefaced robberies and encourage prospecting.

That the foregoing is not an exaggeration is proved by the following extracts from the records of the Sacramento, Cal., Land Office.

In a township which was returned by the surveyor-general as mineral land, these homestead entries were made. As will be noticed, each swears for his neighbor:

1. H. Beauchemin. Entry No. 3718.
Witnesses: C. C. Reed, Geo. Davies, J. Zavella and J. Hillary.

2. C. C. Reed. Entry No. 4332.
Witnesses: H. Beauchemin, Geo. Davies, J. Zavella and J. Hillary.

3. Geo. Davies. Entry No. 4075.
Witnesses: H. Beauchemin, C. C. Reed, J. Zavella and J. Hillary.

4. J. Zavella. Entry No. 4205.
Witnesses: H. Beauchemin, C. C. Reed, Geo. Davies and J. Hillary.

5. J. Hillary. Entry No. 3758.
Witnesses: H. Beauchemin, C. C. Reed, Geo. Davies and J. Zavella.

Final proof of all was made at the same date.

All of this land is notoriously mineral land and contains within its boundaries several of the best lode mines in the district.

On H. Beauchemin's entry is the Lockwood mine, a most valuable mine, which for years has been the principal support of the community around the town of West Point.

Most of the entries have been contested, but with what result has not been ascertained. That it entailed great expense unnecessarily upon the mineral claimants, is undoubted.

These "homestead entries" were unnecessary, because the miner, as a rule, cares nothing for the surface of his claim.

He would be glad to lease or almost give away all except sufficient for his buildings and a few shafts and dumps for his waste rock.

He would be glad to have any part that could be cultivated put to such use.

In this one notoriously mineral township, containing about 22,000 acres, twenty-three of these peculiar homestead applications were proved up, containing nearly 4000 acres. They were examined by a competent surveyor who reported that only about 300 acres in all were under cultivation and productive.

In three cases not a single acre was cultivated, and in nine cases not more than ten acres to any one. Yet two of these proved up 80 acres each, one proved up 110 acres, eighteen proved up 160 acres each, and two proved up 320 acres each, as agricultural land. One had sold a portion of his ground to miners at $60 per acre; another contained the best mine in the district; another had three operating mines on it; another sold eight acres for $3000 for mining purposes, and so on through the list.

These are only a few examples of many that might be cited to show how readily agricultural title may now be obtained to what is plainly mineral land.

Most of these men are not energetic enough to prospect their land, and by their extravagant demands bar out true prospectors, thus depriving the country of a vast amount of precious metal, for all of this ground is gold-producing.

The small area embraced within the boundaries of a mining claim shows it is not the intention of a miner to appropriate any great amount of the public domain. This apparently has been lost sight of by the makers of the regulations.

These United States mining laws are based upon the old mining district laws which were first made by the miners themselves, in the early days of the California gold fields, for an equitable distribution of the mineral land, and only what was thought sufficient for mining purposes was allowed to each one. There was no thought of any title to the ground after the mineral was extracted, and from 1849 to 1866 there was no special provision of the United States laws for the sale of lands on account of the precious metals contained therein. If the mineral was not found in payable quantities the miner was only too glad to be able to abandon it and continue his search elsewhere.

It is so now, and no one need apprehend that a mining man will accumulate "agricultural land" under the mining laws at $2.50 or $5 per acre, with an additional cost of at least $50 per acre for fees and expenses for development, unless he knows that there is sufficient mineral contained therein to recompense him.

The purpose of the present amendment is not to assist the miner in accumulating large tracts of land. It is to protect him from the schemes of designing persons, who have been attracted to his vicinity by his own industry and energy.

Many of these "homesteaders," as has been intimated, are neither miners nor agriculturists; they are either laborers or small shop or saloon keepers. They have no particular ambition, and if by a false oath or two and the expenditure of a few dollars they can obtain, with the assistance of the General Land Office regulations, such a title to land as will enable them to extort a sum in excess of their expenditures, they are only too willing to take the very remote chances of a prosecution for perjury.

It seems unreasonable that the opinion of a person, who only has learned to cultivate the surface of the ground, concerning the value of mineral deposits and geological formations, should outweigh the opinion of a person who has learned the value of such deposits by actual work among them as a miner.

Certainly agriculturists are not the best authority as to what is profitable mineral land; neither is the Register or Receiver of a Land Office.

Some instances are of record where a miner has not only been required to prove his mine "valuable," but actually "dividend paying."

There appears to be an unfair discrimination against the miner, and if the United States makes a distinction and sells the land to miners at an increased rate and in smaller quantities, why should not the Government give him such reasonable protection as this amendment is intended to afford, instead of throwing obstacles in his way and assisting the schemers?

The "agriculturist" only pays $1.25 per acre for his land and is permitted to take up 320 acres, which he withdraws forever from the public domain, but the miner must pay at least $60 per acre (including expenses), can only obtain 20 acres, and after he has extracted the mineral would be glad to restore the land to public uses, because, as before explained, he has no use for the surface.

This proposed amendment will largely tend to satisfy the miner of the intention of the Government to protect him in his work and save him from expensive litigation. If it becomes law he will continue his prospecting until he is satisfied the ground is not valuable for the mineral and then abandon it, thus restoring it to the public domain as suitable for "agricultural" purposes as it was before he made his location.

There are many acres covered by abandoned mining claims which were patented, and thus withdrawn from public use, because the miner was afraid of the "agricultural game" being played on him before he could thoroughly prospect his location.

These "hearings to determine the character of land" are reduced to writing and sent to the General Land Office, accompanied by the decision of the local Land Office. The evidence and decision is there reviewed, and if the General Land Office is of the the opinion that the mining location contains valuable mineral land, instructions are issued by the General Land Office to the local Land Office to permit the mining claimant to have a survey made at his own expense which shall segregate his mineral claim from the agricultural claim.

This segregation survey is in no sense a survey to separate the "mineral land" from the "agricultural land." No investigation whatever is made to the character of the land. The surveyor only surveys the boundaries of the piece marked on the surface as the contested mining location, calculates the area remaining in the particular legal subdivisions (of forty acres each) which surround that particular "location," and furnishes a description of the survey to the local Land Office. This is in turn sent to the Surveyor-General, who marks it on the official maps, and upon the receipt of a copy of that map the general Land Office awards all the land filed on by the "homesteaders" to him as "agricultural land," except the piece located as mineral.

Thus a patent is given to a piece of land as "agricultural" when it is evident, from the miner's location and unmistakable surface indications, that a continuation of the vein matter can be found on the other side of the "right line," which, by General Land Office rulings, based on the false affidavits of these cormorants calling themselves "homesteaders" and "farmers," is made a boundary.

There is a wide distinction between these people and the true "farmer" or cultivator of the ground. With the true farmer the true miner never has a dispute about the cultivable land; as before explained, the miner has no use for more surface ground than is necessary for the convenient working of the mine. He will gladly draw around him a population which will supply himself, family and employes with fresh provisions, and therefore cheerfully does all in his power to encourage such neighbors. Not many true farmers settle in the mineral belts, the altitude and rugged character of the country preventing profitable cultivation.

The necessity for this amendment is also shown by the history of the deep gravel mining claims of California. The mineral sought in this class of mining claims is contained in the beds of prehistoric or buried rivers, the existence of which is only apparent, on the present surface of the country, in the gulches where they have been exposed by the eroding influences of torrential streams.

These old river beds, carved out of the rock, have been partly filled in by the washings and detritus of the former

surface of the mountains, through the canyons and gulches of which they flowed. During at least three different periods great streams of lava flowed, filling these old canyons to a depth of from 300 to 1000 feet, and at least covering, in places, the whole surface of the country. Patches of soil of small area are found on top of the lava capable of sustaining a scanty vegetation. Vast areas of these deep gravel deposits are found in many counties of California and in parts of Oregon, and in most cases they are covered hundreds of feet deep under lava. Where suitably situated and free from lava capping, the gold is obtained by the hydraulic process, the whole bank then being washed away by the application of water under pressure through a nozzle. As the material passes away through the sluices various gold-saving appliances retain the gold.

Where, however, the "deep placer" is covered with lava, it is impossible to work all the material and only the lower and richer strata are mined by the drifting process. Sometimes the pay gravel is a thousand feet deep under the surface, and often many hundreds. In drifting, this auriferous deposit is reached through a long tunnel and the gravel taken out. Many of these tunnels for opening these deposits are thousands of feet in length and are run in from the sides of the ridges or "divides" to tap the auriferous channel. This is the only economical way to work these ancient river bed deposits. When the end of the tunnel finally reaches the valuable channel the auriferous gravel is breasted or drifted out, removed through the tunnel and washed on floors or crushed in "cement mills" to obtain the gold.

There are hundreds of miles of these "lava-capped divides" or ridges in California, in which are the buried channels of ancient rivers, the beds of which are filled with gold-bearing gravel. The surface of such ground has more or less soil and vegetation, but is of little value as compared with the buried gold. It seems absurd that the miner should be compelled to sink several shafts hundreds of feet deep on each twenty acres to prove what he already knows, viz., that there is a buried auriferous channel. It is too expensive to extract this gravel through shafts, the tunnel serving the purpose better, since it also affords drainage for the ground. The channel is enclosed between well-defined "rim-rock" or banks just like the rivers of the present day, and it is this channel the miner seeks. At many places along the course of the channel are other claims being worked through tunnels, and as this channel is continuous, like that of any river bed, it is perfectly reasonable for him to run his tunnel in to reach it without sinking a shaft to prove it is there, and thus entail additional and useless expense in opening the claim.

Still, an agriculturist may take up the surface of the ground he is endeavoring to reach by his tunnel, and in case of a contest the miner must show the existence of paying mineral ground. Although the miner will spend thousands of dollars to open and develop the ground and find the channel, the laws do not recognize the existence of said channel until he gets title to the ground, and he cannot get title until he proves the ground to be valuable for mineral. By the time he is able to prove that the ground may be worked out. For this reason thousands of acres of land which pay from $75 to $300 per running foot in gold go to the agriculturist for $1.25 per acre.

It will not pay to run these costly tunnels to open a single twenty-acre tract of ground, and no individual could afford to perform such work.

California alone has increased the world's circulating medium by the introduction of one thousand one hundred and twenty-five million dollars' worth of pure gold, and a very large proportion of this has been obtained from the gravel deposits.

It can be proved that to extract this from the gravel over one hundred million dollars has been invested in mines and plants.

Surely these interests should be entitled to consideration and not be discriminated against.

The Forest Hill Divide, in Placer county, is one of the numerous lava-capped ridges in California containing an ancient buried river channel. This district alone has a record of gold production of over $30,000,000. The channel pays in different drift mines from $70 to $300 per lineal foot, and when they drifted immediately under the town of Forest Hill itself the gravel paid upward of $1000 per running foot.

All of this channel of gold-bearing gravel is covered to a depth of 500 or 1000 feet with a capping of lava or cement, and the surface might all be taken up as agricultural land as far as ordinary mineral indications are concerned. There is no gold whatever in this lava cement or "pipe clay," and none is found until the gravel channel is reached. This is opened by tunnels run in from the sides of the ridge or "divide." Yet the channel, like any modern river, is continuous, though winding. There are within this one county of Placer some 200 miles of unworked auriferous gravel channels, which, judging from the parts already worked, will yield from $500,000 to $5,000,000 per mile. These deposits are found on nearly all the ridges and divides between the South Fork of the North Fork of the American and the South Fork of the Middle Fork of the American river. By following either the gravel deposits or remaining patches of gravel or capping their general courses can be traced from their source in the high Sierras to the plains.

On the Forest Hill Divide, which is only one of these, the Hidden Treasure mine has produced over $1,500,000 in gold, the channel paying $150 per lineal foot, or $1.75 per ton of gravel. The tunnel to open the deposit is between 9000 and 10,000 feet in length.

The Mayflower drift mine has yielded about $750,000 from ground paying $150 per lineal foot. The gross yield of the bottom gravel was $7 per ton. The channel was reached through 4640 feet of straight bedrock tunnel, 765 feet of incline and a bedrock gangway under the channel with twenty to forty-foot upraises to the channel bottom. Present distance trammed through tunnels from gravel breast to mill, 12,000 feet. Heavy expenditures were made in this mine before the deep channel was discovered and opened.

The Paragon mine has yielded $850,000 by drifting the bottom lead; $900,000 by drifting the upper lead; and $500,000 when worked by hydraulic process. The tunnel is 8500 feet long, and the channel has paid from $125 to $300 per lineal foot. The upper lead paid $10 per ton of gravel, and the lower lead $4.50 per ton.

These are only a few mines cited as examples of those being worked in ground the surface of which shows no signs of mineral; but the existence of a continuous channel being proven by developed mines at different points in the ridge, it seems absurd to let such valuable land pass to agriculturists at $1.25 per acre when it is clearly mineral bearing. As stated, there are numbers of these ridges in which the buried auriferous channels of rivers or streams are found, though nothing on the surface would indicate it, except to those skilled in such matters. But as the miners know by experience where to search, it seems reasonable to let them prove the probable existence of mineral from the adjacent mines being worked.

The large amount of material to be removed in proportion to the gold obtained necessitates conducting the work on a large scale, and therefore the larger companies obtain as much as possible of the channel by consolidating claims, until some of them now own strips of land, believed to contain deep gravel channels, from one to five miles long, and have invested from one to three millions of dollars in the property and plant alone.

As an example, the Mayflower Company in Placer county, above referred to, owning about one and one-half miles of a buried river channel, has run over twelve miles of tunnels and drifts, averaging in cost about twenty dollars a foot. At this time the lava cap is comparatively thin, being five hundred feet thick. If they had been limited to twenty or forty acres of this ground they could not have reached it. Common sense would show that it would not pay to sink a prospect shaft through five hundred feet of lava rock on an uncertainty, neither would they have dared to run their long tunnel for so small an area, even if they could have obtained ground for an entrance.

Moreover, they could not have made a true discovery on the surface, because this lava cap covers all these deep placers, and there is no natural indication of mineral except at the banks of the modern rivers.

They were able to predict from the developments in adjacent claims that the channel was at a certain place, and did not hesitate to expend this large sum on the strength of that prediction. This is not an only case; there are several with lava caps more than one thousand feet thick, and longer tunnels.

Nearly all of these deep gravel placers were prospected and developed by the presumptive evidence furnished by developments of adjacent ground.

In a report of the State Mineralogist of California, in support of presumptive evidence, this appears:

"One of the owners of the Mountain Gate mine at Damascus, California, became convinced that the channel gravel being worked in that mine was identical with two isolated gravel deposits known, respectively, as the Gas Hill claims and the Big Gun mine at Michigan Bluff, the first named being six miles south, the other nine miles south of the Mountain Gate works. Proceeding on that theory, he obtained the grade and direction of the channel, projected it four miles to the south from the Mountain Gate mine in the direction of Gas Hill, and toward the most favorable point in the line of projection constructed a tunnel to come under the channel a certain estimated depth and to reach it in the estimated distance, provided it maintained the grade and line of projection. The trial projection proved substantially correct, and the channel was located in its anticipated position, though there was no surface indication of its presence. The Hidden Treasure mine, so discovered, has developed into one of the best paying properties in Placer county.

"The celebrated Bald Mountain mine at Forest City in Sierra county was discovered by the application of the same principles at an earlier date. The Live Yankee drift mine had been worked through the ridge from Alleghany to Forest City, a distance of about a mile: on the Alleghany side the channel was cut off by Kanaka canyon; on the Forest City side by Oregon gulch. It was successfully projected across this latter, and the Bald Mountain mine, under the mountain of that name, discovered; this latter, in its turn, led to the discovery of the Ruby drift mine, a continuation of the Bald Mountain mine, three miles to the northwest of where the latter was discovered, on the opposite side of the mountain."

After many other similar descriptions of discoveries of mines, and the methods used by the engineers, the article continues:

"By its use it is possible to determine in advance of doing any underground work on the claim:

"1. The approximate location of the line of the bed of the channel.

"2. The approximate elevation of the bed at any desired point.

"3. The location of inlets, outlets or breakouts, and a reasonable certainty of distinguishing between them.

"4. * * * *

"5. The determination of the size of the channel and the probable extent of its pay lead. This being of advantage in estimating the probability of yield sufficient to warrant the necessary outlay of capital in development."

This is followed by several other similar reasons.

In the case of Smelting Company *versus* Kemp, 104 U. S. 636, Mr. Justice Field says:

"The object in allowing patents is to vest the fee in the miner, and thus encourage the construction of permanent works for the development of the mineral resources of the country. Requiring a separate application for each location, with a separate survey and notice, where several adjoining each other are held by the same individual, would confer no benefit beyond that accruing to the land officers from an increase in their fees. The public would derive no advantage from it, and the owner would be subjected to onerous and often ruinous burdens. The services of an attorney are usually retained when a patent is sought, and the expenses attendant upon the proceedings are in many instances very great. To lessen these as much as possible *the practice has been common for miners to consolidate*, by conveyance to a single person or an association or company, many contiguous claims into one, for which only one application is made, and of which only one survey is had. Long before patents were allowed, indeed, from the earliest period in which mining for gold and silver was pursued as a business, miners were in the habit of consolidating adjoining claims, whether they consisted of one or more original locations, into one, for convenience and economy in working them. It was, therefore, very natural, when patents were allowed, that the practice of presenting a single application with one survey of the whole tract should prevail. It was at the outset, and has ever since been, approved by the Department, and its propriety has never before been questioned. *Patents, we are informed, for mining ground of many millions of dollars, have been issued upon consolidated claims*, nearly all of which would be invalidated if the positions assumed by the defendants could be sustained.

"It was urged on the argument that a patent for each location was required to prevent a monopoly of mining ground, to prevent — to use the language of the counsel — the public domain from being 'monopolized by speculators.' The law limiting the extent of mining lands which an individual may locate has provided, so far as it was deemed wise, against an accumulation of them in one person's hands. It could not have prohibited the sale of the location of an individual without imposing a restriction injurious to his interests, and in many instances destructive of the whole value of his claim. *Every one at all familiar with our mineral regions knows that the great majority of claims, whether on lodes or on placers, can be worked advantageously only by a combination among the miners, or by a consolidation of their claims through incorporated companies.* Water is essential for the working of mines, and in many instances can be obtained only from great distances, by means of canals, flumes and aqueducts, requiring for their construction enormous expenditures of money, entirely beyond the means of a single individual. Often, too, for the development of claims, streams must be turned from their beds, dams built, shafts sunk at a great depth and flumes constructed to carry away the debris of the mine. *Indeed, successful mining, whether on lode claims or placer claims, can seldom be prosecuted without an amount of capital beyond the means of the individual miner.*

"There is no force in the suggestion that a separate patent for each location is necessary to insure the required expenditure of labor upon it. The statute of 1872 provides that on each claim subsequently located, until a patent is issued for it, there shall be annually expended in labor or improvements one hundred dollars; and on claims previously located an annual expenditure of ten dollars for each one hundred feet along the vein; but where such claims are held 'in common' the expenditure may be upon any one claim. As these provisions relate to expenditures before a patent is issued, proof of them will be a matter for consideration when application for the patent is made. It is not perceived in what way this proof can be changed or the requirement effected, whether the application be for a patent for one claim or for several claims held in common. *Labor and improvements within the meaning of the statute are deemed to have been had on a mining claim, whether it consists of one location or several, when the labor is performed or the improvements are made for its development, that is,* TO FACILITATE THE EXTRACTION *of the metals it may contain, though, in fact, such labor and improvements may be on ground which originally constituted only one of the locations*, as in sinking a shaft, or be at a distance from the claim itself, as where labor is performed for the turning of a stream, or the introduction of water, or where the improvement consists in the construction of a flume to carry off the debris or waste material. It would be absurd to require a shaft to be sunk on each location in a consolidated claim when one shaft would suffice for all the locations; and yet that is seriously argued by counsel, and must be maintained to uphold the judgment below."

A decision by the Secretary of the Interior now attempts to limit a location of a placer claim to the twenty acres around a discovery on a placer claim, and this was on an appeal from a decision of the Commissioner of the General Land Office reversing a decision of the Register of the local Land Office reducing an application for a one hundred and sixty acres location to ten acres, which was based upon a location made upon unsurveyed land, and accompanied by a special official survey. This was a special case, but the language of the Secretary's decision makes it apply to all placer claims, and it is being so used by the local offices.

On May 26, 1894, the U. S. Supreme Court, in the case of R. V. Bardon et al. *versus* Northern Pacific Railway Company, on appeal from the Circuit Court of Montana, said:

"The territory was known to embrace great quantities of minerals, including gold and silver, and in all grants to railways mineral lands * * were excepted, and such grants were never known to pass title to minerals. It was impossible, at the time of the grant, for Congress to know what lands contained minerals. * * *

"The United States could not have meant * * * to give away the title to such imperial wealth, but left the discovery of minerals to future explorations. It was a certain rule of grants that nothing was conveyed by implication except what was absolutely essential to the enjoyment of the grants." * * *

Now, as the railroad lands are intended to be sold as agricultural lands, it is evident that the Supreme Court does not believe that mineral lands should be used except for mining purposes, and this decision will surely be applicable to the "homesteaders."

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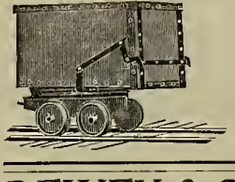

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Department Rulings and the Miners.

The following is the speech delivered before the State Mining Convention by Mr. A. H. Ricketts:

It is well known that the mining law as it is now administered is not conducive to the stability of the miner's possessory title when his rights are antagonized by the claims of the agriculturist or lie within the limits of a railroad grant. This unsatisfactory condition of affairs is directly traceable to the position assumed by the Land Department of the United States, which has become a *quasi* judicial tribunal exercising legislative functions; and unfortunately its rulings and practice are too often made the subject of favorable judicial decision. The Supreme Court of the United States, however, often corrects Department errors and compels it to modify its procedure in matters affecting the public lands. And that court has recognized the necessity of further legislation to enforce upon it a stricter regard of its duties in respect to the issuance of patents which are repeatedly issued without the investigatiou and consideration which the public interest requires. But the owner of patented mining ground has always been reasonably secure in his holdings.

The machinery of the law called into action in the attempt to "break," or more technically speaking, to set aside or annul a patent, is more cumbrous and expensive than is an attempt to wrest an unpatented mining claim from its owner under the pretense that it is more valuable for agricultural than for mining purposes. The question of the relative value of lands arises in the Land Department whenever these two classes of claims come in conflict, and is a rule of decision created by the Land Department and adopted by the courts. Briefly, this rule is that in contests affecting the character of the ground, if the land is worth more for agricultural purposes than for mining, it is not mineral land, although it may contain some measure of the precious metals; and, in determining this question, no contingencies, possibilities or even probabilities are considered, but the "proof of the mineral character of the ground must be specific and based upon the actual production of minerals. It is not enough to show that neighboring or adjoining lands are mineral in character, or that the land in controversy may hereafter develop minerals to such an extent as to show its mineral character, but it must be shown as a present fact that the lands are mineral, and this must appear from actual production of mineral, and not from a theory that the land may hereafter produce it. "Indeed," said a learned United States District Judge, "mere mineral prospect or hope, however pleasing or auspicious, shall not keep the land from the plow or the pruning-hook, and it is well that it does not." The Supreme Court of the United States lays down the doctrine that surface indications of the existence of veins do not constitute a mine. It does not even prove that the land will ever be, under any conditions, sufficiently valuable on account of its mineral deposits to be worked as a mine. The mineral claimant, when contest is forced upon him by the agriculturist, must prove: First, that the land is valuable for minerals; and second, that it is more valuable for mining than for agricultural purposes. If the land is valuable for minerals under the law, it should only be sold as mineral land without reference to its relative value for agricultural purposes. This question of comparative value of the land is the outgrowth of judicial and department legislation before referred to, and it is so deeply rooted that only an act of Congress can eradicate it.

What the nature and extent of the deposit of precious metals is which will make a tract of land "mineral" or constitute a "mine" therein, within the statute, has not yet been judicially determined; but the Land Department holds that "the mere fact that portions of the land contains particles of gold would not necessarily impress it with the character of mineral land. It must at least appear that it contains metal in such quantities as to make it available and valuable for mining purposes;" or, in other words, "that to constitute mining land it must also be shown it will pay to mine by the usual mode of mining." "The statute," says a learned judge, "does not reserve any land from entry as a homestead simply because some one is foolish or visionary enough to claim or work some portion of it as mineral ground without reference to the fact of whether there are any paying mines on it or not. Nothing short of *known* mines on the land, capable under ordinary circumstances, of being worked at a profit as compared with any gain or profit that may be derived therefrom when entered under the homestead law, is sufficient to prevent such entry." In other words, presumptions are indulged in on behalf of the rancher, but not of the miner. The agriculturist does not have to base his right upon the actual production of any crop which may be disposed of at a profit; he may rest his claim upon conjuncture, and the possibilities of his neighbors may constitute the probabilities of his own efforts towards success. It is true that all mines do not pay, so is it true that all farms or ranches do not pay; and it is safe to assert that there are more abandoned ranches than there are abandoned mines within this or any other mining State. In order to uphold his rights, the miner must prove that his mine is a "known" and a "paying one," but no proof is required from the agriculturist that his ranch is or ever will be a paying one. The opinion of farmers on the future capabilities of its vegetable or vine-growing possibilities, say, is sufficient to make it valuable for agricultural purposes in the eyes of the Department. For the illustration of this fact I refer to the notorious Manzanita case. This property is at Sulphur Creek, and has been worked for the last thirty years as a mining claim. About two years ago it fell a prey to an agricultural claimant, who discovered that no patent had been issued to or applied for by the mineral claimants.

The homestead applicant filed an affidavit in which he stated, among other things, that he is well acquainted with the character of said land, "that there is not to his knowledge within the limits thereof, any vein or lode of quartz or other rock in place bearing gold, silver, or cinnabar, or any other valuable mineral deposit; that no portion of said land is claimed for mining purposes under the local customs or rules of miners or otherwise; that no portion of said land is worked for mineral during any part of the year by any person or persons, *that said land is essentially non-mineral* land, and that his application therefor is not made for the purpose of fraudulently obtaining title to mineral land, but with the object of securing said land for agricultural purposes." This lying affidavit, this perjured testimony, was met at a hearing duly had before the local Land Officers by proof that the lands embraced in the homestead application, and which were claimed by the homestead applicant as essentially non-mineral land, had been worked continuously for over thirty years as mining ground; that hundreds of feet of shafts, cuts, tunnels, drifts and crosscuts had been sunk and run; that by these means thousands of tons of ore had been developed, which ran from $1.50 to $32.50 a ton in gold and from one-quarter of one per cent to sixty per cent in quicksilver; the cost of mining and reducing which was as low as sixty-five cents per ton. That the amount of ore uncovered was so enormous that it would require years to reduce it with the present machinery upon the ground, which was capable of reducing 120 tons of ore every twenty-four hours, or a minimum value of about $50,000 a year. That Professor Becker, the Government Geologist, had reported, in Vol. 13, U. S. Geological Surveys, that "one of the most interesting deposits in the world is the Manzanita mine on Sulphur creek. This ore consists of cinnabar and gold, which are sometimes in direct contact, and some metacinnabarite. The Manzanita forms a link between cinnabar and gold mines, and shows that both minerals may be deposited from the same solutions, not merely in traces but in notable quantities." It was further shown that this "essentially non-mineral land" contained innumerable veins and veinlets carrying gold and cinnabar in greater or less quantities, forming as it were a reticulated mass which in its entirety formed a zone upward of 150 or 200 feet in width and over 2000 feet in length.

It was further shown that the land is very hilly and sterile and its soil is permeated by chemicals and minerals to such an extent as to kill all vegetation. That there is so much sulphur in the ground that its odor can be detected a mile away, and that the land would not raise anything but hay, and not more than a ton to the acre at that, which under the most favorable conditions would make the value of the crop about $2400 a year. Yet the officers of the local Land Office decided that the land was more valuable for agricultural than for mining purposes, and they made the astonishing statement as one of the reasons for such a remarkable decision that "the Manzanita Company had not taken sufficient precaution to protect its valuable mine." What precautions the company should have taken to protect its valuable mine does not appear, but possibly its laches consisted in not applying for an agricultural patent. The fact that a "known mine" existed was proved, the comparative value was shown, and the ratio thereof was, say twenty to one in favor of the mine owner. An appeal to the Commissioner of the General Land Office resulted in an affirmance of this outrageous abrogation of the mining law; the Commissioner saying that the contestant failed to show said land to be more valuable for minerals than for agricultural purposes. We hope that this decision is the Commissioner's by adoption only; for it was evidently prepared by some one who has as much knowledge of a mine as a dog has of the stellar constellation. If this case serves as a beacon light to warn the owner of an unpatented claim of the dangers which surround him; if it serves to impress upon this convention the necessity of curbing the grasping power of the agriculturist and the perversion of the mining law by the Land Department, by appropriate legislation, this case is not without its value. The mining law must be so amended that the rights of the miner shall no longer be subjected to the vagaries of the rancher or continue to be the foothall of the Land Department of the United States.

The subsidized transcontinental railroads have not been a whit behind the agriculturist in efforts to secure the mineral lands, and they, like the agriculturist, take no heed of miners' locations or his possessory rights. For example, take the case of the Eagle Bird mine, known in the law books as Francouer v. Newhouse. Its patent was issued to cover a portion of an odd numbered section. This did not deter the Railroad Company from making its deed of this patented mine as agricultural land to one Francouer, who promptly brought suit in ejectment against the mine owners. The question of the mining patent cut considerable figure in the case, and incidentally it appeared that the Railroad had sought to patent the property as agricultural land, notwithstanding the existence of the mining patent. Think of it, a patent upon a patent, and the Government supposed to have a different title for each applicant. The case was tried before a jury and resulted in a victory for the mine owner. Since that time, and because so many points of law were settled against the Railroad Company, but little, if any attempt, has been made to secure such properties through the courts, but the fight is going on all the time and the forum chosen is one where juries are unknown and regulations are promulgated by which the Railroad Company is made the arbiter of its own case.

In no other tribunal than that of the Land Department could such a thing be possible. But the present regulations have just that effect and the Bardeu decision is supposed by it to sanction such a course. It really does nothing of the kind. It announciates no new principle of law, but does uphold the Land Department in its practice and contention that matters relating to public lands and the selection thereof are within its jurisdiction until patent issues. Mr. Justice Field, who delivered the opinion of the Supreme Court of the United States in the Barden case, in the course of the opinion says: "As justly observed by counsel for the defendant in their very able brief, 'the reservation in the grant of mineral lands was intended to keep them under Government control for the public good, in the development of the mineral resources of the country, and the benefit and protection of the miner and explorer, instead of compelling him to litigate or capitulate with a stupendous corporation and ultimately succumb to such terms, subject to such conditions, and amenable to such servitudes as it might see fit to impose.' * * * "An affirmance of the judgment in this case would enlarge the grant of the Government against its oft-repeated exception of mineral lands, and give to the plaintiff the vast mineral wealth of the States through which the grant passes. It would render the plaintiff corporation imperial in its resources—one that would outshine 'the wealth of Ormus and of Ind.' And, as counsel observes, the same rule would apply to all our transcontinental railroads and give to them nearly all our mineral lands, when Congress has time and again declared that they should have no mineral lands."

In the very teeth of this opinion, and because Mr. Justice Field took occasion therein to say, "The fact remains that under the law the duty of determining the character of the lands granted by Congress, and stating it in instruments transferring the title of the Government to the grantees, reposes in officers of the Land Department," such officers have issued new and additional instructions affecting the selection of lands within the railroad grants, which have but little regard for the interests of the Government or of the mineral claimants. These rules could not better serve the railroads if they were of their own creation and adopted at some transcontinental railroad convention. These rules provide that "where the lands selected by the company are within a mineral belt or proximate to any mining claim the railroad company shall be required to file with the local Land Office an affidavit by the land agent of the company, which affidavit shall be attached to said list when returned, setting forth in substance that he has caused the lands mentioned to be carefully examined by the agents and employes of the company as to their mineral or agricultural character, and that to the best of his knowledge and belief, none of the lands returned in said list are mineral lands." * * That notice of the railroad's selection shall be given by advertisement, and if no protesting voice is raised within the sixty-days' period of newspaper publication, such selections are to be patented as agricultural lands.

The agents and employes designated by the railroad companies to determine the character of the land may, at the option of their employer, remain unknown to the people and the Government.

They are not required to make a report except to the railroad company, which report need not be in writing or under oath, and its character may well be imagined.

The affidavit required of the land agent of the railroad company based upon such report is not only an *ex parte* statement, but the rankest kind of hearsay evidence, which would not be admissible in a court of law. But it is sufficient in the eyes of the Land Department to control its action in the disposal of the public lands and to cast the burden of proof upon the party who disputes its truth.

It is true that contests and protests are provided for by the regulations under discussion, but under such restrictions and conditions as to render such action of but little value.

The notice to be given of the railroad's selections is so vague that the opportunity to even take such steps may be lost. The notice is to be published in such newspapers as shall be designated by the Commissioner of the General Land Office. These may be the Monarch of the Dailies or the Poker Flat Bazoo, either or both of large circulation, but neither, perhaps, within hundreds of miles of the selected lands, which are to be described by townships only and without naming the adverse claimants therein. No personal service of this notice is to be given, no posting of notice on the lands is to be had; nothing but a designation by township lines. This pretended notice is tantamount to no notice at all. When a miner seeks a patent for his mining claim the Land Department regulations affecting his application are of a most stringent character and most rigidly enforced, with wholesome regard for possible adverse rights. And the local land officers and those of the General Land Office at Washington vie with each other in efforts to wholly reject or return his application upon the most trivial pretexts. An application for patent has been *rejected* because the local land officers could not determine therefrom whether it created *any* conflict with prior agricultural patents. An application for patent has been *rejected* by such officers because some twenty odd years before some one had commenced proceedings for a patent for a portion of the same ground by having it officially surveyed, and then ceased to proceed with the matter. The fact that a valid relocation had been made by the present claimant cut no figure with them. An omission of the course and distance of the line connecting the mine sought to be patented with the system of public surveys in the notice of application has been sufficient to put the claimant to the expense of commencing his proceedings anew. And it was not until a decision of the Supreme Court of the United States compelled such action could a consolidated application be filed in the Land Office. Why the railroad companies are not subjected to like rules when applying for agricultural patents is one of the more or less absorbing mysteries of the day.

The extraordinary attitude of the Land Department toward the miner cannot be too strongly condemned. Its power in the matter of the disposition and selection of the public lands must be curtailed. Its usurped power to legislate and practically repeal the Act of Congress by so-called regulations and circular instructions must be taken from it. Its power to favor one class of land claimants more than another must be wholly done away with. The procedure in the matter of contests and protests between the miner and the farmer must be conducted under the rules of evidence and in accordance with the practice of courts, if it is to continue to act as a *quasi* judicial tribunal; but as contests between miners have to be taken to a court of competent jurisdiction, so also let contests involving the character of land be taken there. It was Congress which gave to the Land Department its power, which has resulted in complex, uncertain and unsatisfactory rules, and a mode of procedure too often made the vehicle of injustice and the cloak of the blackmailer. It is therefore to Congress that we must appeal to right the abuses now existing; and it is the duty of this convention to hammer at its door with such vehemence that there will be no mistaking your meaning.

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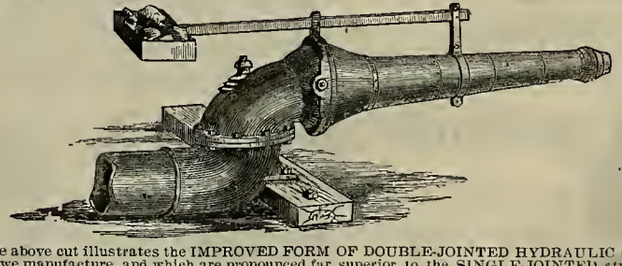

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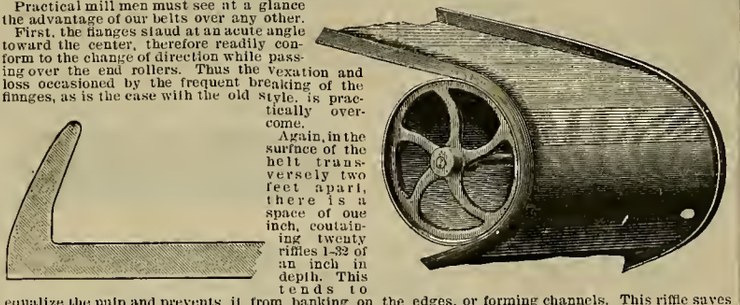
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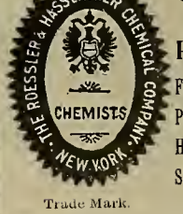

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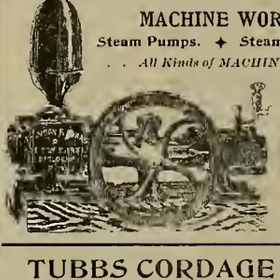
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Montana—Edmund H. Hazelton, Thomas G. Merrill.

Nevada—F. G. Newlauds, H. M. Yerrington, W. E. Sharon, Archie McDonald, W. E. F. Deal.

Alameda—W. R. Thomas, R. W. Snow, G. R. Taggart, George Uhl, George Goodman, A. F. Merriman, J. M. Wright, J. J. Newsom, T. W. Jeffress, Walter Harruh (alternate for George Baker), E. C. Rigney, Mack Wehher, D. H. Jackson, Otto Blankhart, W. E. Hale (alternate for R. W. Gorrill).

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The Nicaragua Canal.

Last Saturday a conventiou of public organizations assembled by invitation in the hall of the Chamber of Commerce to consider the prompt construction of the Nicaragua canal.

The Geographical Society of the Pacific, represeuted by a committee with Professor Davidson as chairman, sent in a most interesting report, showing the great saving of time and distance to be brought about by the caual in transportation by water between California and the East. In case of war our cruisers could be quickly shifted from one coast to the other as needed, thus doubling the efficiency of our navy.

Senator Geo. C. Perkins, Mr. Geary and others addressed the meeting, showiug in many points the bearing which the completion of this great waterway would have on the interests of our State.

Much diversity of opinion was brought out as to the best method to pursue. Some of the speakers insisted that our Government should coustruct the canal, the fact that such action is prohibited by treaty being believed to be susceptible of modification. It was urged that no corporation should have anything to do with it.

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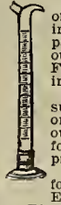

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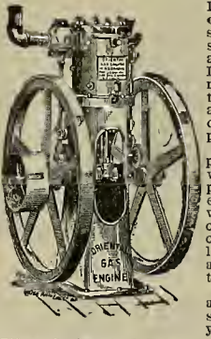

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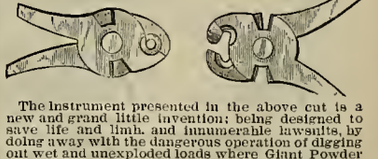

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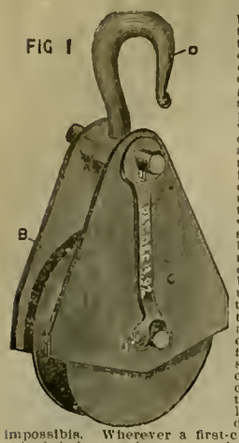

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Douglas Island, Alaska, July 31st. 1894.

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Yours very truly,

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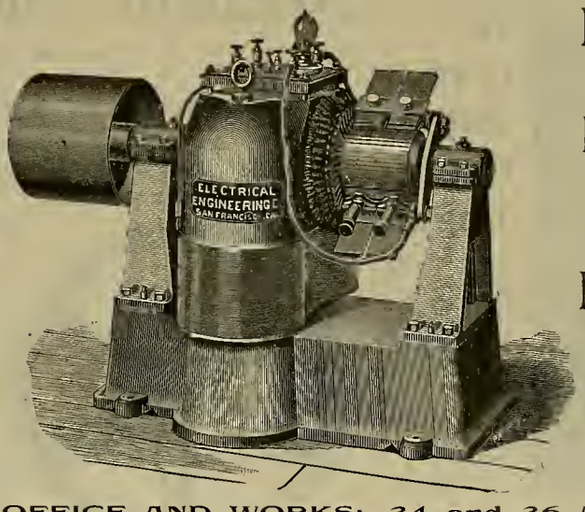

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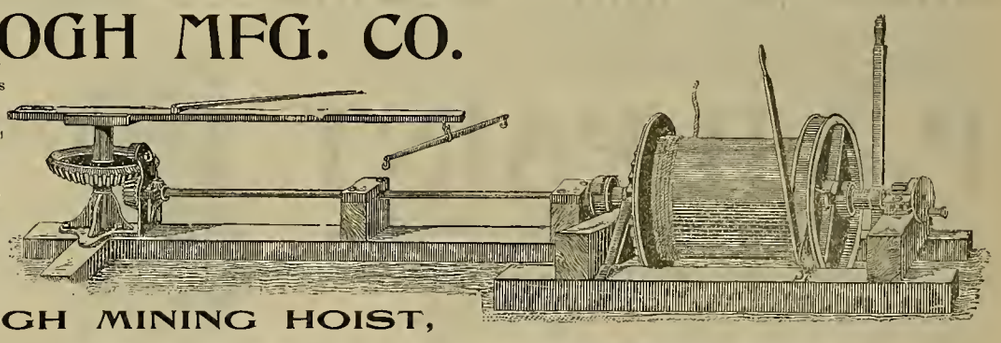

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By J. S. PHILLIPS, M. E.

The work is divided into four parts - Rocks, Veins, Testing and Assaying. The geological chapters are intended to give miners a practical idea of the various formations. The chapters on mineral veins are derived from long observation, and the section on exploration has been carefully considered. All that relates to discrimination and assay has been kept as free from formulæ as possible. The work is written for practical men, and all the explanations and discriptions are clear and to the point. It is so prepared that it is useful to uneducated men as well as scientists.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

REVERSIBLE DRIVING GEAR FOR CARS.—James Hopkirk, San Francisco. No. 529,268. Dated Nov. 13, 1894. The object of this invention is to provide a mechanism for transmitting power from any suitable engine, motor or other source, to the traction wheels of a car in such a manner that it may be driven in either direction, quickly reversed or brought to a standstill without interfering with the continuous running of the motor in one direction. It consists of a truck frame having traction wheels and engine shaft adapted to rotate continuously in one direction, gear wheels meshed together and fixed upon shafts journaled upon the frame, and a gear upon the engine shaft engaging one of these gears so that they are rotated in opposite directions; sleeves turning loosely upon the gear shafts and friction clutches upon the shafts and sleeves, one of said clutches being engaged to rotate the sleeve in one direction and the other clutch engaged to rotate said sleeve in the opposite direction; a shaft carrying a gear which engages the gears upon the sleeves and is rotated in opposite directions by the engagement of the clutches and pulleys with endless flexible hands connecting the shafts, with suitable means for maintaining an equitable tension of the driving belts.

BOX WIRING AND HOOPING MACHINE.—Edward A. Cooley, Cloverdale, Cal. No. 529,247. Dated Nov. 13, 1894. This invention relates to an apparatus which is adapted to apply hoops, bands or wires around boxes for the purpose of strengthening and securing them. It consists of vertical main frames adjustable to and from each other, having their upper portions adapted to swing outwardly, adjustable supports carried by the upper portions upon which the box rests, means for supplying the banding material, a lever carrying a clamping device at its upper end for grasping the banding material and a foot lever connected with the lower portion of said lever whereby the banding material is drawn to the proper tension when secured upon the box.

CARRIER FOR CAN-MAKING MACHINE.—R. D. Hume, Gold Beach, Oregon. No. 529,269. Dated Nov. 13, 1894. This invention relates to an attachment for can-making machines which is adapted to move the can intermittently through the various stages and operations to which it is subjected in the process of forming. It consists of longitudinally reciprocating toothed plates or bars moving upon each side of the horn upon which the can bodies are to be advanced, mechanism by which the plates are alternately moved in transverse planes toward each other so that the teeth engage the can bodies to be advanced and are then moved forward to complete the stroke, then separated from each other, so that the teeth are clear of the can bodies and returned to their first position.

SAW HANDLE.—M. M. Cope, Noyo, California. No. 529,063. Dated Nov. 13, 1894. This handle is intended to be readily applied to and removed from different saws. The device comprises a ring at one end for receiving the handle bar, said ring being formed with an externally threaded shank having a cross hole near its base, a sleeve or follower upon the shank, a head piece and a hinged clamp adapted to engage the saw blade between them, said headpiece having a head entering the shank of the handle ring and secured by a cross pin, and a nut on the shank having means for engaging the follower, whereby the latter is set up to hold the clamp and head together and withdrawn to relieve them.

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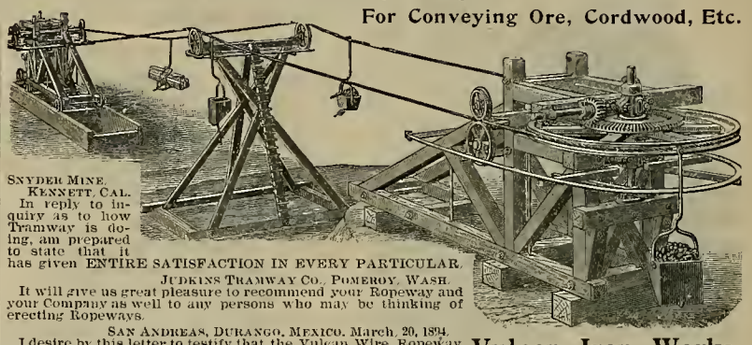

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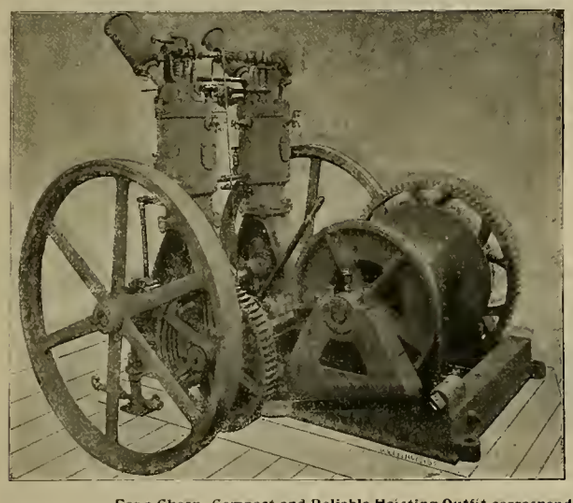

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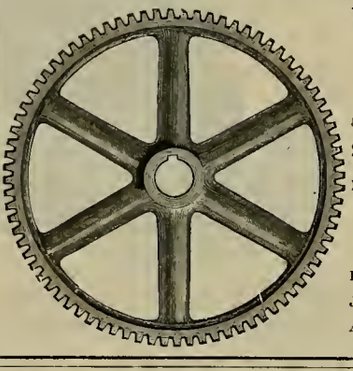

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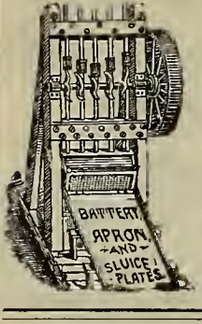

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The Miners' Convention.

(*Continued from page 324.*)

each County Association in proportion to its membership—I mean all the transactions.

This motion was duly seconded and carried.

THE CHAIRMAN: Gentlemen. I take pleasure in introducing to you Senator Cross. [Senator Cross' address will appear in our next issue.—ED.]

At the opening of the afternoon session Judge Niles Searles addressed the convention as follows:

Mr. President: My duties, gentlemen of the convention, have been of such a character that I have had but little opportunity to be here with you, and I do not expect to be long with you on account of these duties elsewhere. Permit me to congratulate you upon the number and seeming men of character who compose this body. You have met here not simply in the interest of the miners of the State of California, but in the interest of a business which redounds to the welfare and the profit of all the people of this commonwealth.

In your persistent efforts to revive mining, in all its pristine vigor, you are accomplishing a work which will redound not only to your advantage as miners, but to the best interests of all the people of California.

At the outset of what may be termed the "contest," which has culminated in the present Miners' Association, we were much in the condition of the ax-man who goes into the forest to fell the mighty trees. He finds it necessary for his own security to first remove the underbrush, which tends to retard his progress and may divert his keen steel from its course to its own injury and destruction. It was a good deal so when this contest arose. There were a good many mining questions involved. The people at large did not view it in all its proportions when a few of the leading hydraulic mines were interdicted by the action of the courts; a good many others anxious to procure their conviction, it is just possible, consented for a consideration to receive permits to go on with their work. One result of this was that the people who said that hydraulic mining occupied an inferior place in the economy of the prosperity of this State saw but little lull in the volume of business which was being transacted. The output of gold continued pretty large, and they did not realize the barren results which would follow a complete cessation of that branch of industry. When, however, the present condition was created on the part of the General Government, composed as it is of men of high character and rare intelligence, a different state of things occurred. Hydraulic mining then, for the first time, really ceased. The result has been felt from one end of this State to the other until to-day men realize the effect which follows that cessation, and now for the first time we are able to take up the proposition, divested of all collateral questions, "Can hydraulic mining be prosecuted and the interests of navigation and of the agriculturist at the same time be conserved?" We answer that in the affirmative, and say that to answer it otherwise would impeach the genius of the American people. What under the laws of nature can be accomplished, the engineer can accomplish with sufficient means at his command.

That the road will be blazed out through and by which the interests of all the people will be conserved, through your instrumentality and influence, I have faith to believe. Much that has been done, it seems to me, is a sequence of the wisdom which you have shown in the selection of officers who have controlled this organization during the last two or three years. It has been your good fortune to have at the head of this organization a gentleman who has inspired confidence in the people in all parts of the State; a gentleman to whom men, whatever their views might be, could turn with approbation; a gentleman who has conducted your affairs in that spirit of honesty and economy which has redounded, and if continued will redound to the interest not only of this Association, but to the benefit of every interest involved in this State. I allude, gentlemen, to the Hon. Jacob Hart Neff, your worthy president. And knowing as I do full well by many years of experience, associated with him and engaged as I have been more or less in the transaction of public business in this Association, I take great pleasure in placing his name before the convention for president for the ensuing year.

MR. MCBRIDE: Gentlemen of the convention: The Hon. Jacob Hart Neff has been placed in nomination as president of this Association for the ensuing year. Does the convention wish to present any other nomination? Do I hear a second to the nomination already made?

MR. SHERWOOD, of Marysville: Mr. Chairman, before you put the question, will you allow me to say a word? I come here from Marysville. I have lived there thirty-five years. I wear the badge today of the Miners' Association, and I want to say to you here, gentlemen, that the choice of this convention, so far as it has gone, should be the unanimous choice of not only the miners of California, but the agricultural interests, that he should be the chairman and the leader of this movement. You have produced that which you see in the foreground, sir, the shaking of hands between the valley and the mountains. I second the nomination of Mr. Neff for president of this Association for the next term.

The question was then put by Major McBride and unanimously carried.

Three cheers were then given for Hon. Jacob H. Neff.

MAJOR MCBRIDE: Hon. J. H. Neff, you have been re-elected, and properly, too, as president of this Association. Now take the chair.

PRESIDENT NEFF: Gentlemen of the convention, would that I possessed language to express the feelings of my heart to you for this mark of your esteem. I had hoped, and so expressed myself to a number of gentlemen who are delegates here, that some other person might have been selected to carry on the work that I have endeavored, with the assistance of the Executive Committee, to carry on for the past three years. I can say, and say it honestly, that my whole heart, every nerve I possess, has been engaged and employed in this undertaking. With what success we have met, you gentlemen are apprised of. I, of course, feel the time approaching of advancing years. I am not the man I was ten or fifteen years ago, but still I have sufficient vigor and manhood left to carry on this work for the ensuing year, if my good Maker will permit me to do so. Bear in mind, however, gentlemen, that we require your assistance in this work. It is a glorious undertaking. If we can bring to bear the intelligence, the industry of the miner, assisted by the commercial bodies and other businesses of this State, we will surely succeed.

To my good friend, Judge Searles, who so flatteringly presented my name here, I can but say, My good old friend, thank you; and to my friend Sherwood, of Marysville, whom I have always esteemed as one of my best and earliest friends, although somewhat covered up with slickens at times, I thank you. Mr. Sherwood has known me for years, and knows my efforts have always been in the right direction, and when I took hold of this work, at the urgent solicitation of some of the valley people, I did so hoping to bring about a feeling of accord in the two great industries, mining and farming, and I hope to God that the initiative now started will succeed in the end.

THE CHAIRMAN The next business in order will be the selection of the Secretary. Nominations are now in order.

MR. SEARLS (of Nevada county): Mr. Chairman and gentlemen of the convention, I shall endorse what has been said about your chairman. You all know him. I believe that we might have searched the State of California over, and not found another man on whom we could all have united as we could on Jacob Hart Neff, that has combined all interests. We all have confidence in him and we know he is the right man in the right place. But, gentlemen, you are the representatives of that great body, the Miners' Association, and when you return to your constituents, you want to be able to say to them that you have carried out fully the good work that was presented to you, so far as you have ratified and confirmed the work of this Association during the past year. You have nominated our chairman, but it yet remains to elect the secretary, and I want to say to you, gentlemen, that from my own knowledge I know that Mr. W. C. Ralston, in the hour of need, has gone to the business men of San Francisco and the business men of this State. They have remembered his father; they have remembered what he did for the people of San Francisco, and the people of the State of California, and they have known that W. C. Ralston's judgment was right, and they have contributed with that liberality characteristic of the people of San Francisco and of the State of California. Gentlemen, we wish to carry out what we have early commenced—let us re-elect our old secretary. I have the pleasure, the honor, the privilege of placing in nomination Mr. W. C. Ralston.

JUDGE BELCHER: Mr. Chairman, I rise with great pleasure to second the nomination of Mr. Ralston for secretary of this Association. When we commenced our labors, and when it was necessary for the interests of the miners of this State that there should be erected a body of this nature, you and Mr. Ralston were of the first chosen to the respective offices which you now fill. It was, and at all times has been, necessary that there should be keen vigilance, that there should be a continuance of the indefatigable labor in behalf of the Association for the purpose it has in view to accomplish. Mr. Ralston has been all that we could possibly desire; he has been more than that—he has rare executive ability. He is not only acquainted with all the history of our Association so far as the work and the correspondence go to make it up, but with the old traditions that go along hand in hand with the daily and yearly life of the Association. We must grow and not stand still. This is a body of conservative men. This is in no wise a political institution. There should be no change of officers except for cause. There are no spoils to the victors here; there is every reason why those who have been to us worthy should be continued in their places. Therefore, I take great pleasure in asking, and desire that this nomination shall meet with the approval of this whole convention, and I second the nomination of Mr. W. C. Ralston for secretary.

MR. SHERWOOD (of Marysville): Mr. President, on this occasion, I have an apology to make to the gentleman that you propose to re-elect. I want to say that we have had trouble, we have seen tears shed on the one side, and we have seen hard times on the other side. I have always been straightforward on one proposition. As the editor of a newspaper, I have said things that I would not say personally. I have said of the gentleman that he was a "kid-gloved miner." Now, that may not be appropriate in ordinary business, but with an argument that you are making while you are editing a paper in the valley, it is good logic. But since then I have met him, I have become acquainted with him, and I want to say to you, gentlemen, that I do not believe it is so; I will take it back, and I will endorse his nomination.

C. W. TOZER (of Nevada): Mr. Chairman, I rise to second the nomination of Mr. W. C. Ralston for secretary of our Association. I have not in the remotest degree a personal acquaintance with the gentleman, and I only know of him two things, both of which are self-evident and obvious. The one—he is the son of his father, whom I did know; the other self-evident and obvious proposition is this—he has since the very inception of this organization, with zeal and with ability, faithfully performed the duties of secretary of this organization. Therefore, sir, I again say, I second the nomination of my friend, W. C. Ralston's eldest son.

The nominations were then closed and Mr. Ralston was unanimously elected by acclamation.

THE CHAIRMAN: Mr. Ralston, it affords me great pleasure, sir, having served with you for three years, to bear testimony to the indefatigable purpose of your labors. You have been re-elected by this Association as secretary for the ensuing year. Three cheers were then given for Mr. Ralston, and there were calls for a speech.

MR. RALSTON: Mr. Chairman and Gentlemen of the Convention: Some of my friends of Placer are calling for me to make a speech; they know I cannot make one, and that is the reason they have called for it. I wish to thank you, gentlemen, for the honor you have bestowed upon me by re-electing me secretary of this Association. I consider it one of the greatest honors ever bestowed upon me to have been elected the first time, and with the repeated elections I have more and more felt the honor. I have done my duty. I have done the best I could. I thank the gentleman, Mr. Searles, who so kindly placed me in nomination, and the gentlemen who seconded it. If it gives me a little too high opinion of myself, I will try not to have any trouble by getting the big head as some young men do. But I wish to thank you, gentlemen, and say that any young man who is elected secretary of the California Miners' Association, an association of men who have made the State of California what she is, and to which every one is turning now to help out of her destitute condition, ought to feel proud. I consider it the greatest honor that could be bestowed. Gentlemen, I thank you.

THE CHAIRMAN: The next business in order will be the election of vice-president.

JUDGE BELCHER: Mr. Chairman, in the line of the conservative sentiments that have been expressed here, and which undoubtedly we must treasure and keep if we must preserve our integrity as an association, and be to the State of California that advantage towards better days that we hope to be, I have pleasure in placing in nomination Mr. Samuel K. Thornton for vice-president of this Association for the ensuing year.

JUDGE SEARLES: I regret, sir, that I have overlooked one thing—the Searles family seem to be the great North American nominators. And it only proves how easy it is to do things if you only have discernment enough to float with the stream. Now, I have another son who is not here, and had I thought of it, I would have had him here to nominate Mr. Thornton, but he being absent, I rise to second the nomination of that excellent and capable gentleman.

The nominations were then closed, and Mr. Thornton was unanimously elected by acclamation.

Julian Sonntag and W. W. Montague were nominated for treasurer, and Mr. Sonntag, the present incumbent, was re-elected.

(*To be Continued in our Next Issue.*)

Resolutions Adopted by the Convention.

The following report of the Committee on Resolutions was unanimously adopted:

WHEREAS, The settlement of the State of California by Americans was brought about through the discovery of gold within its borders, and for many years the paramount industry was gold mining, which built up and enriched the many cities and communities then founded, it seems eminently proper that the people of this State, through their representatives in Congress, should aid in the resuscitation of this important industry, now suffering under unjust rulings and decisions of the Government departments and by the gradual encroachments of those not miners upon its mineral domain; therefore be it

Resolved, That our Senators and Representatives in Congress are hereby urged and requested to give their best efforts to aid the California Miners' Association in the passage of such mining bills or amendments as may be indorsed by the annual

convention of said association and presented for the consideration of Congress.

Resolved, That we recommend the re-enactment of the law passed at the last session of the Legislature, entitled "The California State Debris Commission, which appropriated the sum of $250,000, to be available when the General Government appropriated a like amount, for the purpose of the building of restraining dams, under the direction of United States engineers.

Resolved, That as the State Mining Bureau is the only State commission maintained in the direct interest of the miners of California, its scope should be broadened, rather than curtailed, to keep pace with the increasing mineral development. The published reports of the bureau serve to advertise to the world the mines and mining interests of California and bring into public notice the condition of all branches of one of our chief industries, thereby inducing examination and investment by capital. We hereby affirm our confidence in this institution and urge the necessity of its proper maintenance on such scale and by the employment of such technical skill as will permit it to still further advance the mining interests of the State.

WHEREAS, We recognize that our present greatness is due to the mining industries of the West, and we believe that our future prosperity depends upon the rehabilitation of gold and silver mining, and recognize the paramount importance of these allied industries as a factor in Western civilization and prosperity; and

WHEREAS, History bears us out in the statement that the demonetization of silver in 1873 resulted in an era of falling prices, in the increasing of the burden of debts, in the enrichment of the creditor classes; and believing that there can be no permanent return of prosperity unless silver shall be restored to its true position as a money metal, he it

Resolved, That the California Miners' Association declares itself in favor of the free coinage of silver at the ratio of 16 to 1, independent of any other nation, and to this end requests our delegation in Congress to further all legislation tending to the restoration of silver to its place as a money metal of the world, believing that such legislation would he for the best interests of our common country, and would meet with the unanimous indorsement of our people.

Resolved, That with gratitude we acknowledge the valuable assistance rendered to this association by the Board of Trade of San Francisco, through its strong and liberal financial and moral support, which has largely advanced the mining industry of this State.

Resolved, That the miners of California gratefully acknowledge the assistance they have received from the press of this city and of the interior in their efforts to place their industry on a more satisfactory basis. Without this assistance it is impossible for the miners to plead their cause before the public and obtain that popular recognition which will insure favorable consideration before the Legislature and Congress.

WHEREAS, There are extensive tracts of unoccupied mineral lands in the mining States and Territories, in order to develop which roads or trails must he built by the miner, thus entailing upon the individual miners an expense which the Government should hear, as it obtains the benefit from the sale of said mineral lands; therefore he it

Resolved, That Congress is requested to appropriate for each of the well-known mining States and Territories the sum of $50,000, said sum to be expended under the direction of the Governors and Surveyor-Generals of each State or Territory, or such other official as may be designated, for the purpose of building trails and roads to open and develop the mineral lands for sale by the Government; and the Senators and Representatives of the mining States and Territories are earnestly requested to secure this appropriation.

Resolved, That it is the sense of this convention that immediate action he taken to stop the issuance of patents to the Central Pacific railroad on pending selections awaiting the approval of the Department of the Interior for lands in the mineral section of California. It is further resolved that the Secretary of the Interior be requested hy telegraph to delay action thereon until a hearing is had on the subject. It is further resolved that a special committee of five members he appointed to take the necessary steps to secure such hearing and present the necessary facts and information to secure the rights of mining locators on land within the Central Pacific Railroad grant.

Resolved, That for the purpose of developing the immense mineral resources of northern California, consisting of iron, silver, copper, gold and other valuable minerals, we urge that additional national aid he extended toward the improvement of the Sacramento river as far as the city of Redding (the head of navigation), so as to furnish cheap and permanent transportation to markets demanding such products.

The following resolution commending the work of the Debris Commission was adopted on motion of J. M. Fulweiler of Placer:

WHEREAS, Under the several acts of Congress, relating to the rehabilitation of hydraulic mining, those eminent civil engineers, Colonel G. H. Mendell, Lieutenant-Colonel W. H. H. Benyaurd and Major W. H. Heuer, were appointed and have been the acting California Debris Commission and have made a report of their acts and proceedings under said laws of the United States, which is now before this convention; therefore he it

Resolved, That the said Commission has the entire indorsement and support of this convention. That we commend the various acts and decisions of said Commission and heartily indorse their recommendations as to the future of the mining industry of the country. That the hearty co-operation of the Hon. J. F. Kidder, State Debris Commissioner, in the efforts of the Congressional Commission to bring about the rehabilitation of hydraulic mining, meets with the approhation, and the thanks of this convention are hereby tendered to said Commissioners for the able, fearless and efficient manner in which they have each and all of them discharged their duties and made the prospect of good times, plenty of work and plenty of money possible to the mining sections of this country and through them to the commerce, the industries and revenues of our nation, and bringing once again prosperity, hope and happiness to the home and fireside of every miner.

Report of the Legislative Committee.

The Legislative Committee of the convention, which had the most important labors to perform, presented the following report, which was adopted:

To the President, Officers and Members of the California Miners Association—GENTLEMEN: Your Committee on Legislation beg me to report as follows:

We recommend the following changes in the Revised Statutes of the United States, relating to mining:

Amend section 2324 so that the same shall read as follows:

"Section 2324. Miners of each mining district may make regulations not in conflict with the laws of the United States or with the laws of the State or Territory in which it is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must he distinctly marked on the ground so that its boundaries can he readily traced, such marking to include one post or monument at each corner of the claim. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location and such description of the claim or claims located by reference to some natural or permanent monument as will identify the claim. On each claim located, and until payment of the purchase money and a certificate of entry has been issued therefor, not less than $100 worth of labor shall he performed, or improvements made during each year.

"Where such claims are held in common such expenditure may be made upon any one claim by any work or improvements tending to develop any such claims. The periods within which the work required to be done annually on mineral claims shall commence at 12 o'clock meridian on the first day of January succeeding the day of location of such claim. When the labor required hy this act shall have been performed or the improvements made an affidavit may be filed within thirty days after the time limited for the performance of such labor or making of such improvements with the Recorder of Deeds in the county in which the claim or mine is situated, particularly describing the labor performed and the improvements made, and the plat thereof and affidavit shall he prima facie evidence of the facts therein stated; and upon a failure to comply with the conditions of this act, in the performance of labor or the making of improvements, the claim or mine upon which such failure occurred shall he open to relocation in the same manner as if no location had ever been made; provided that the original locators, their heirs, assigns or legal representatives do not record work upon the claim after such failure and before such relocation, and continue the same with reasonable diligence until the required amount of labor shall have been performed or improvements made. Upon the failure of any one of several co-owners to contribute his proportion of the expenditure required hereby the co-owners who have performed the labor or made the improvement may, at the expiration of the year, give such deniquent co-owner personal notice in writing, or notice by publication in the newspaper published nearest the claim, for at least once a week for ninety days, and if at the expiration of ninety days after such notice in writing, or hy publication, such delinquent shall fail or refuse to contribute his portion of the expenditure required in this connection his interest in the claim shall become the property of his co-owners who have made the required expenditure. The copy of such notice, together with an affidavit showing personal service or publication, as the case may he, of such notice, when filed and recorded with the Recorder of Deeds in the county in which such mining claim is situated, shall be prima facie evidence of the acquisition of such co-owners. Where a person or company has run or may run a tunnel, or constructed roads or trails for the purpose of developing a claim or claims owned by said person or company, the money so expended in running said tunnel or constructing said roads or trails shall he taken and considered as expended on said claim or claims; provided, further, that said claim or claims shall he distinctly marked on the surveys as provided in this act."

We further recommend that section 2324 of the Revised Statutes or the United States he amended hy adding thereto the following:

"And the surveyors appointed under the provisions of this section shall have power to administer oaths to their assistants."

We further recommend that section 2335 he amended so as to read as follows:

"Section 2335. All affidavits required to he made in this chapter may he verified before any officer authorized to administer oaths in the State or Territory where the claims may he situated, having an official seal, and all testimony and proofs may he taken before any such officer, and when duly certified by the officer taking the same, attested by his seal of office, shall have the same force and effect as if taken before the Registrar and Receiver of the Land Office. Whenever any contest shall arise as to the mineral character of any land claimed to he subject to entry or sale under an act of Congress, it shall be the duty of the Registrar of the Land Office in which such contest is made, to immediately certify such contest to a court of competent jurisdiction in the county where such land is situated, and to immediately notify the contestants and contestee thereof. Within thirty days after such notice the contestant shall file in such office a verified statement of the facts upon which he hases his contests in plain and concise language, and shall serve the same upon the contestee, and thereafter and within the time provided hy the laws of the State or Territory where such land is situated, in answering any civil action, the contestee shall file his verified answer to such statement and thereupon the contest shall he tried and determined as are ordinary actions in such court, and when determined such determination shall he certified to the Registrar and such determination shall he hinding upon him and shall he forever conclusive as to the character of the land in question; provided that the presence of rock in place hearing gold, silver, cinnahar, petroleum or other valuable mineral shall he regarded as presumptive evidence that the land containing the same is mineral in character; and provided, further, that in investigating the character of land with a view to ascertaining whether it is more valuable for mineral than for agricultural purposes, evidences may he taken of the mineral discovered or developed adjacent to such land, proof of which may be taken as presumptive evidence that the land is mineral in character; and provided, further, that wherever land is proven to he within well-defined mineral helt, such land shall be deemed, presumed and taken to be mineral land, unless contrary is proven; and provided, further, that the provisions of this chapter shall he liberally construed, with a view to aid the applicant in procuring title to the mineral lands of the United States, and that the rules and regulations prescribed by the Land Department for its government and that of its officers, in disposing of said lands, shall he so formulated and administered as to assist the Government in disposing of said lands to bona fide applicants; and provided, further, that all applicants for patent for lands, other than mineral lands, upon which existed a valid mining location, the notice of which designating the section and township in which such location is situated shall have been recorded in the office of the Recorder of Deeds of the county wherein the land in question is situated must, except when otherwise in this act provided, give to such mineral claimant notice of such application in writing, or hy publication in the newspaper published nearest such mining location, at least once a week for sixty days."

We further recommend that section 2337 of the Revised Statutes of the United States he amended so as to read: "Section 2337. Where non-mineral land not included in a lode claim is used or occupied, or is intended to he used or occupied, hy the proprietor of such vein or lode claim for mining or mineral purposes, such non-mineral surface ground may be embraced and included in an application for a patent for such vein or lode claim, and the same may he patented therewith or separately subject to the same preliminary requirements as to certificate or notices that are applicable to vein or lode claims, but no location hereafter made of such non-mineral land shall exceed ten acres, and payment for the same must be made at the same rate as fixed hy this chapter for the superfices of the lode claim. The owner of a quartz mill or reduction works not owning a mine in connection therewith may also receive a patent for his mill-site as provided in this chapter."

In connection with the foregoing recommendations concerning the amendment of the Revised Statutes of the United States, your committee would further suggest that such changes be effected hy an amendment of the so-called Stewart mining bill which recently passed the United States Senate and is now pending in the lower house of Congress. Your committee recommends that all changes in the Revised Statutes other than those above suggested he opposed hy this association.

Your committee would also state that it has carefully examined into and deliberated upon the provisions of House bill No. 3476, introduced in the Fifty-third Congress hy the States of Montana and Idaho, with reference to the classification and selection of mineral lands lying within the grant to the Northern Pacific Railroad Company, within said several States, defining what shall be classed and taken to he mineral land, and providing for the procedure to he adopted by the Land Department, whether the report of the Commissioners provided for in such act as to such selection are contested or otherwise, and your committee respectfully recommends that the representatives in Congress from the several mining States he requested hy this convention to give the bill their hearty support.

Your committee would also suggest an amendment to the Code of Civil Procedure of this State to the effect that in all civil actions in the courts of this State, where a temporary injunction is issued at the time of filing the complaint, such injunction shall be dissolved at the expiration of one year from the date of service thereof unless the parties to the action consent to it continuing in force for a longer time, or unless the action he set for a hearing upon its merits.

Your committee would further recommend that the following act be presented to Congress and its passage urged:

"An act appropriating money for the construction of works to impound mining debris, and thereby to protect the navigable streams of California.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

"Section 1. That there is hereby appropriated out of any money in the treasury not otherwise appropriated the sum of one million and thirty thousand dollars, which sum shall he immediately available and shall be expended under the direction of the Secretary of War, in accordance with the plans, specifications and recommendations of the California Debris Commission, appointed under the act of Congress entitled 'An act to create the California Debris Commission and regulate hydraulic mining in the State of California,' approved March 1, 1893, for the purpose of constructing works for the restraining and impounding of mining debris upon the tributaries of the Sacramento and San Joaquin rivers in California and the branches of such tributaries.

"Sec. 2. Whenever any such works for the restraining and impounding of mining debris shall have been constructed out of such appropriation, or shall have reached such a stage as, in the opinion of such commission, it shall he safe to use the same, it shall he lawful for such commission to make the order provided for in section 13 of said act, upon proceedings being first had and taken in accordance with the provisions of sections 9, 11 and 12 of said act, but in such cases the owners of the mines affected hy said orders shall not he bound hy the proviso to said section 13 of said act nor hy the provisions contained in section 16 thereof.

"Sec. 3. The said commission shall also have the power to make the order provided for in section 13 of said act as to any mine or mines whenever it shall appear to the satisfaction of said commission that no impounding works are necessary other than the means already provided hy nature to protect from material injury the navigable stream mentioned in said act and the land adjacent thereto, upon proceedings had in accordance with sections 9, 10 and 12 of said act."

Your committee further recommends that section 23 of an act entitled "An act to create the California Debris Commission and regulate hydraulic mining in the State of California," approved March 1, 1893, he amended so as to read as follows:

"Section 2322. That any person or persons who willfully or maliciously injure, damage or destroy, or attempt to injure, damage or destroy, any dam or other works erected under the provisions of this act for restraining, impounding for settling purposes, or for use in connection therewith, shall he guilty of a misdemeanor, and on conviction thereof shall he fined not to exceed the sum of $500 or he imprisoned not to exceed five years, or hy both such fine and imprisonment, in the discretion of the court; and any person or persons, company or corporation, hy their agents or employes, who shall mine hy the hydraulic process, directly or indirectly injuring the navigable waters of the United States in violation of the provisions of this act, shall he guilty of a misdemeanor, and upon conviction thereof shall he punished hy a fine not exceeding $500."

All of which is respectfully submitted.

ELECTRICAL CONSTRUCTION.

California Electrical Works,

ELECTRICAL MINING MACHINERY

and ISOLATED PLANTS INSTALLED.

Construction, Factory Work and Supplies of Every Description.

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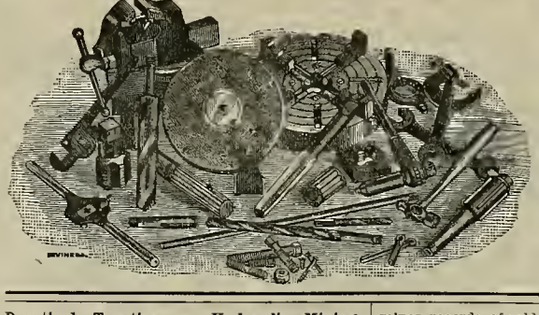

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Full lines of the above manufacturers carried in stock. Telephone 1776.

Practical Treatise on Hydraulic Mining.

BY AUG. J. BOWIE, JR.

This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on heavy grades, methods of mining shallow and deep placere. history and development of mines, records of gold washing, mechanical appliancee, such as nozzles, hurdy-gurdye, rockers, undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, postpaid. For sale by THE DEWEY PUBLISHING CO., 220 Market St., San Francisco.

Concentrates.

JAMES BURKE is reopening the New York Consolidated between the Kate Hayes and W. Y. O. D. claims, Nevada Co.

THE Golden Star Mining Co. of Montana, a wild cat scheme with headquarters at Chicago, is trying to foist its stock. The concern is a good thing to decline.

A. MCFADDEN of the Yankee Fork mine, near Challis, Idaho, is about to put a fifteen-stamp mill on the mine. It will be a wet crusher, six vanners, electric light, etc. The mine shows much ore.

THE Weiser, Idaho, *Signal* says the Little Giant mine at Warreus has netted Geo. Reibold $50,000 this season. Reibold took hold of the mine and every one laughed at him. He can now laugh at the other fellows.

ON Dec. 8th the property of the R. H. Campbell Gold M. Co. at Quartz Valley, Siskiyou Co., will be sold at sheriff's sale on a judgment in favor of Herbert Kraft for $6190 and costs. It includes mining land, personal property, machinery, tools, etc.

ARTICLES of incorporation of the Anita Gold Mining Co. have been filed in Amador Co. by F. Reichling of Oakland, D. E. Hays of Mill Valley, John Barton of Alameda, George Goodman of Oakland and W. E. Davis of San Francisco. The company is capitalized at $10,000,000.

AT the Golden Feather, near Oroville, the completion of the new foot dam and the removal of the elevator will be deferred, the remainder of this season being devoted to putting things in proper shape for the winter. Col. McLaughlin expects to work the bed of the Feather next year.

THE Colorado Iron Works asks for a receiver for the International Nickel Mining Co. on behalf of all creditors. The complainant is a judgment creditor holding claims of $4629 and $3211. The capital stock of the defendant is $5,000,000, but it is claimed the property owned by it never exceeded in value $100,000. The scheme was floated by Gillette and Taylor, of Chicago, who bought a claim covering 260 acres in Douglas county, Or., from Selah Reeves for $51,000.

IN El Dorado county the Grand Victory is being again extensively developed; a ten-stamp mill is running on the Gentle Annie and a twenty-stamp mill on the Big Canyon. The owners of the Shaw mine are about to put in a one-hundred stamp mill, and a twenty-stamp mill is to be put on the Havilah.

THE *Record* says that financial difficulties involving Mr. Blake have brought an end to the railroad and consolidation scheme between the Pioche Con. Co. and the Nevada Southern Railroad. The railroad and other property owned by Mr. Blake are heavily in debt. Legal proceedings have been instituted and the properties are under attachment.

OFFICIAL NOTICES of three new and important laws relating to the public lands have been received. The first gives one additional year of grace for settlers on homesteads and desert lands who cannot make final proof this year. The second suspends for 1894 the requirement that settlers on desert lands shall spend $1 per acre for reclamation. The third increases the value of soldiers' additional homestead certificates.

THE usual sad results have followed the rush of miners to the placers of the Yukon river in Alaska last spring, says the Butte *Inter-Mountain*. Many miners from Butte, but scantily prepared for the rigors of a winter in that far northern latitude, participated in the stampede. Recent reports are to the effect that a few of them have done well and have something to show for their season's work, but many have been left stranded in that inhospitable region, and a few are "beating" their way back to "God's country" with the fixed resolve never to be caught in another stampede.

THE residents along Snake river were recently surprised to see a raft coming down the stream, having on board two men and a horse. On nearer approach the load was recognized as a prospector's outfit, with camp utensils and all the other paraphernalia of a prospector's life. The raft was a large one for the purpose, being 20x30 feet. It was a great scheme for getting out of the mountains, says the Lewiston *Teller*. They can run the raft below and work up the logs into wood, besides the transportation beats roughing it over the mountain trails.

THE Washoe Copper Company has incorporated at Butte, Montana. The incorporators are Charles F. Booth, Jobu Gillie, D. M. Newbro, Joseph A. Lewis and Oscar K. Lewis. The capital stock of the company is $5,000,000, divided into 50,000 shares of $100 each. The company is formed for the purpose of carrying on mining, smelting, etc., and the trustees are C. F. Booth, John Gillie, D. M. Newbro, J. A. Lewis and O. K. Lewis. The principal office of the company will be in Butte. This is the company which is now developing the Gold Hill properties.

AT Provo, Utah, the defense in the case of Phillip Cook vs. the Bullion-Beck & Champion Mining Company, wherein plaintiff sued for $15,000 damages, was to the effect that the stope wherein the accident occurred was abandoned, and no one was expected to walk over the plank that broke. Furthermore, plaintiff was a timberman, and was paid extra for his hazardous position. He should have investigated the soundness of the timber and used due caution. Judge Smith, after the arguments by counsel, instructed the jury that it was necessary for all to agree on the verdict. The jury gave plaintiff $3000. Thirty days' stay of execution was granted to allow defendant to prepare a motion for a new trial.

THE California Debris Commission has issued permits to the Volcano Gold Mining Company and the Chiua Hill mine, Amador county, to operate by the hydraulic process. The most important application yet made to the Commission has been filed by the Gold Run Ditch and Mining Company, which owns the Gold Run mine at Dutch Flat, Placer county. This company proposes to construct two debris dams in the North Fork of the American river. The estimated storage capacity to be created is 12,000,000 cubic yards. The plan calls for rock dams of "dry masonry." This means rocks placed and fitted by hand, without the use of cement, mortar or other binding material.

Cheap Reduction of Refractory Ores.

—IN OUR—

Oxyhydrogen Quick Fire Process

For the cheap reduction of refractory ores, we first crush and pulverize the ore as it comes from the mine, without the use of water, to about forty mesh; then feed it into our

Oxyhydrogen Blowpipe Furnaces,

Where, with the use of compressed air forced through the blowpipes, the ore is kept in a constant whirl through the 100 feet of furnace construction, enveloped all the time in OXYHYDROGEN FLAMES, which completely roasts or deoxidizes it in the few minutes it takes to pass through.

SPECIAL FLUXES ARE USED,

Which hold most of the values that are in a volatile form until they are reduced to a metallic. The ore passes from the furnaces into the ore tank, while the vapors or volatile matter, being under pressure, passes over into the next tank, where it is deposited in a PREPARED LIQUID, which retains all remaining values. The ores containing the precious metals are passed from the ore tank into our

"Amalgamating Mill,"

Where the gold and silver are extracted. The gangue or pulp is from thence passed on to the

PATENT CORRUGATED WOOLEN-WEB CONCENTRATOR,

Where the "Flour Quick" and any remaining particles of metal are caught and saved. In operating these furnaces the oxygen and hydrogen gas burned makes a saving of about one-half the fuel. Therefore, in operating furnaces that will treat fifty tons of ore per day the consumption of wood is only about three cords. By this rapid process gold and silver base ores can, at the mine, be worked from the dump to base bullion for from $1.50 to $3.00 per ton, according to size of plant (providing wood is not over $3.50 per cord and water plenty), and the result will show a saving of ninety to ninety-five per cent of the fire assay.

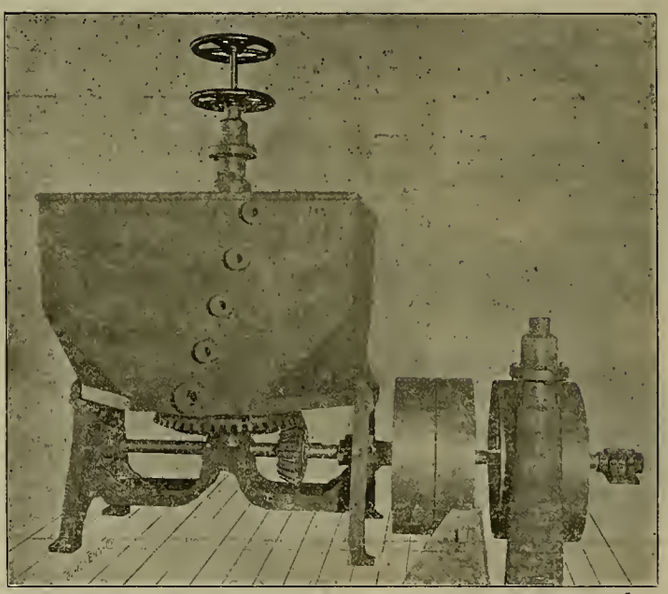
The owners of this process have reduction works here, for making **small or large WORKING Tests.**

They desire to erect complete plants of their own patent machinery on mines, at expense of the owners, to work from ten to fifty tons per day, and receive a small royalty therefrom during the life of their patents. Many samples of base ores can be seen at office, also the working tests made.

HOLLAND & ROBINSON,

OFFICE.....170 CROCKER BUILDING

Amalgamator and Settler.



The above cut represents a combined Pan and Settler for the purpose of working Mill Tailings, Concentrates, Sulphurets, Tellurides, and refractory Gold and Silver Ores, by the Steam Pan Process, or by Roasting and Amalgamation.

Will handle Gold Bearing Beach Sands the best of any mining machinery now in use.

It is designed for grinding and amalgamating the ore by a rapid movement of the Shoes and Muller, then change the speed to a slow movement of the same, and let in water to settle and flow out at the upper plug openings at first, and so on till all the pulp has left the pan, and the gold and silver with the quicksilver remains in the bottom of the pan to be taken out at pleasure, or after a large amount of ore has been worked.

These pans are manufactured of good material, in the best workmanlike manner, and warranted to do the work for which they are designed. They work by charge. Capacity, one and one-half tons. Weight of machine complete, four thousand five hundred pounds.

Small Laboratory Pans of fifty pounds capacity are also provided of the same pattern as the large size, for the purpose of trial tests, which are kept in constant practical use at the sampling works, **10 Stevenson street, San Francisco, Cal.**, to determine what process is required in handling different ores.

Mining Property Examined, Analysis of Ores, Plans, Specifications, Estimates of Cost, and information as to the most profitable way of opening up and developing mines and milling ores.

G. W. STRONG, San Francisco, Cal.

List of U. S. Patents for Pacific Coast Inventors.

FOR THE WEEK ENDING NOV. 6, 1864.

528,861.—BAND CUTTER—Crisp & Stevenson, Halsey, Or.
528,775.—CARRIER—C. P. Hogue, Portland, Or.
528,673.—CAN MAKING MACHINE—R. D. Hume, Gold Beach, Or.
528,906.—FRUIT WRAPPER—Benj. Leonard, Sacramento, Cal.
528,602.—CIRCULAR SAW—Jas. Little, S. F.
528,784.—SHOE—T. F. Marshall, Oakland, Cal.
528,677.—UNION OF METAL BARS—J. T. McCormick, S. F.
528,892.—SASH LOCK—C. A. Robert, Portland, Or.
528,692.—CARD CATALOGUE—A. J. Rudolph, S. F.
528,693.—BINDER FOR BOOKS—A. J. Rudolph, S. F.
528,823.—DAM—Harriet W. R. Strong, Los Angeles, Cal.
528,834.—FRUIT BASKET—C. W. Weston, S. F.
528,835.—VENEER BASKET—C. W. Weston, S. F.

Notice of Assessment.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1894, an assessment, No. 1, of 5 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 56, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of December, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, 309 Montgomery St., Room 56, San Francisco, California.

Notice of Assessment.

NOTICE OF ASSESSMENT.—OCCIDENTAL CONsolidated Mining Company; location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey Co., Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of November, 1894, an assessment, No. 17, of five cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth day of December, 1894, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the cost of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

VALUABLE MINING PROPERTY FOR SALE.

A ditch carrying 150 miner's inches of water and ten miles long, through some rich gold placer claims unworked. Three mining claims—gold—with pipes and giant and sluice boxes, all complete for working, will be sold

At Public Auction, on Saturday, Dec. 8, 1894,

On the estate of the late ELLIOTT McKINSTRY, on the banks of the Middle Fork of the American river, 1¼ miles east of Auburn, Placer county, Cal., at 1 o'clock, P. M.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from E. P. Hagar & Samuel Peck in the U. S. Grant Mine, near Blue Tent, Nevada Co., Cal., to impound tailings behind brush dam in ravine below the mine; from John Black in the Spanish John Mine, near Rough & Ready, Nevada Co., Cal., to impound tailings behind brush dams in blind ravines and pit; from the Good Hope Mining Co., in the Richmond Hill Mine, near La Porte, Plumas Co., Cal., to impound tailings behind log and crib dam in Onion Valley Creek; from Leonard Dormody in the Martelle Mine, near Salmon Falls, El Dorado Co., Cal., to impound tailings behind dams in Martelle Creek; from J. M. Read & N. E. Beckwith in the Pine Grove and Hidden Treasure Mines, near Pine Grove, Amador Co., Cal., to impound tailings behind brush dams in Saw Mill Gulch and behind log and rock dam in Grass Valley Creek; and from the Gold Run Ditch & Mining Co., in the Gold Run Mine, near Dutch Flat, Placer Co., Cal., to impound tailings behind a rock filled dry masonry dam, 100 feet high, in the North Fork of the American River, about 2 miles above its junction with the Middle Fork, gives notice that a meeting will be held at Room No. 62, Flood Building, San Francisco, Cal., on Nov. 26, 1894, at 1:30 P. M.

Bigelow & Fogg, BAY CITY IRON WORKS,

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WROUGHT IRON GIRDERS, TRUSSES, IRON ROOFS, PRISON CELLS, IRON STAIRWAYS, GRATINGS, FENCES, ETC.

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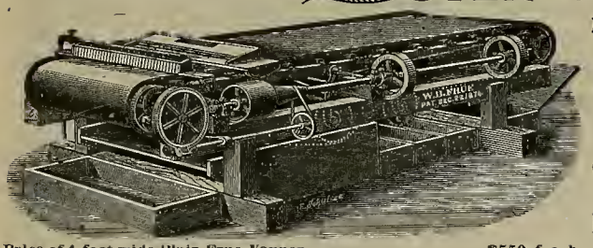
FRUE ORE CONCENTRATOR.

OVER 4000 IN ACTUAL USE.

Manufactured under Patents of April 27, 1880; September 18, 1883; July 24, 1888; March 31, 1891.



Price of 4-foot wide Plain Frue Vanner ..... $550, f. o. b.
" " " Improved Belt Frue Vanner ..... 700, f. o. b.
" 6-foot " Plain Belt Frue Vanner ..... 700, f. o. b.

For any information, pamphlets, circulars or testimonials, call on or address

Jas. S. Brownell,
(Successor to ADAMS & CARTER,)
AGENT FOR THE
FRUE ORE CONCENTRATOR,
132 MARKET ST.,
San Francisco, Cal.

GLADSTONE MINING COMPANY, C. J. Clark, M. E., Gen'l, Supt. FRENCH GULCH, Shasta Co., Cal., Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill. C. J. CLARK, Gen'l Supt.

The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager.

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

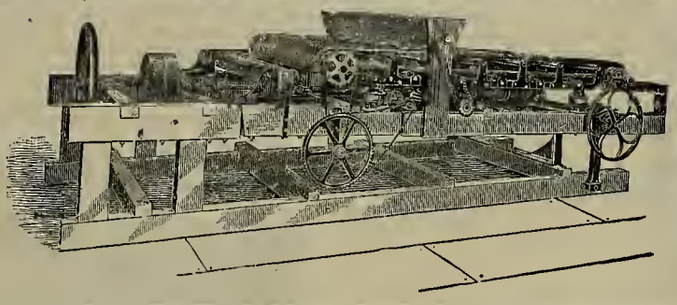
NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness, combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
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was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891, MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. Price $575 f. o. b. Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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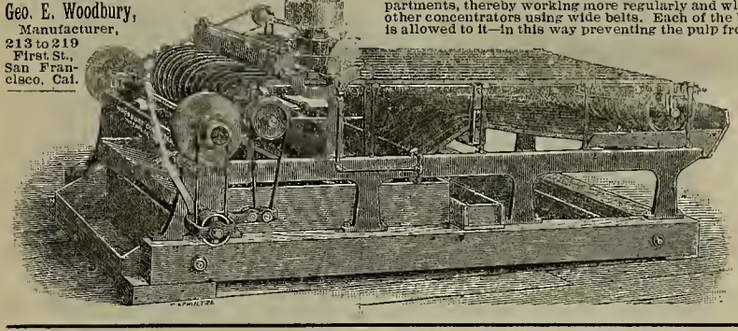

PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1894

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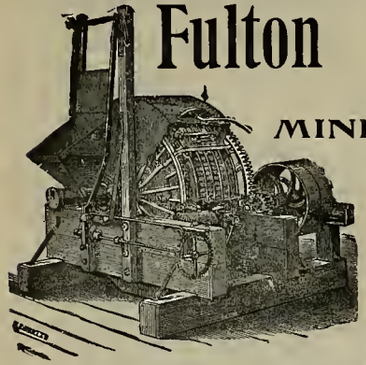

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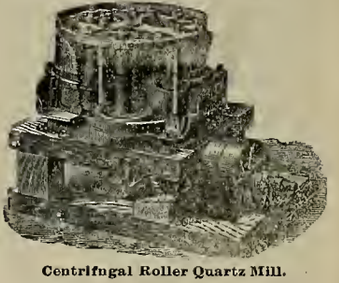

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 22. SAN FRANCISCO, SATURDAY, DECEMBER 1, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Debris Commission.

Unusual interest was attacbed to last Monday's meeting of the California Dehris Commission, the application of the Gold Run Company for permission to operate its hydraulic mine being made the occasion of a bitter attack on the company hy the attorney of the Anti-Dehris Association. The application is the most important read since the organization of the Commission, dams of more than ordinary magnitude being required and considerable opposition being manifested to the granting of the permit. The company ask to be allowed to huild a rock fill dam 100 feet high; 240 feet below the center of tbe main dam it is proposed to place a small dam of similar character in order to form the cusbion pool at tbe hase of the main dam. The material proposed to be used heing the trap-rock forming the sides of tbe canyon, to he quarried out on eitber bank on a level with the top of the dam in order to increase tbe width of the spill, the sluice to be six feet wide, two feet deep, with a grade of six inches in twelve feet. Amount of material to he worked per hour, 100 cuhic yards.

The material is estimated to consist of nine per cent boulders, thirty per cent cobhle stones, fifty per cent gravel, ten per cent sand, one per cent loam or pipe clay.

The area to he worked is that part of the claims enumerated, situated in the cbannel of the Blue Lead, consisting of ninety-four acres. The channel is ahout 400 feet average widtb, probahly 100 feet at tbe hottom, and the depth about 125 feet.

The survey for tbe reservoir was carefully made, but was not carried heyond 16,800 feet above the dam. The capacity to tbat point is ahout 12,000,000 cuhic yards. A reservoir formed by the dam would be equal to 12,000,000 cubic yards.

There being hut one per cent of clay is accounted for by the top dirt having been previously washed off in operating the mine.

The Commission discussed the matter at length and took it under advisement.

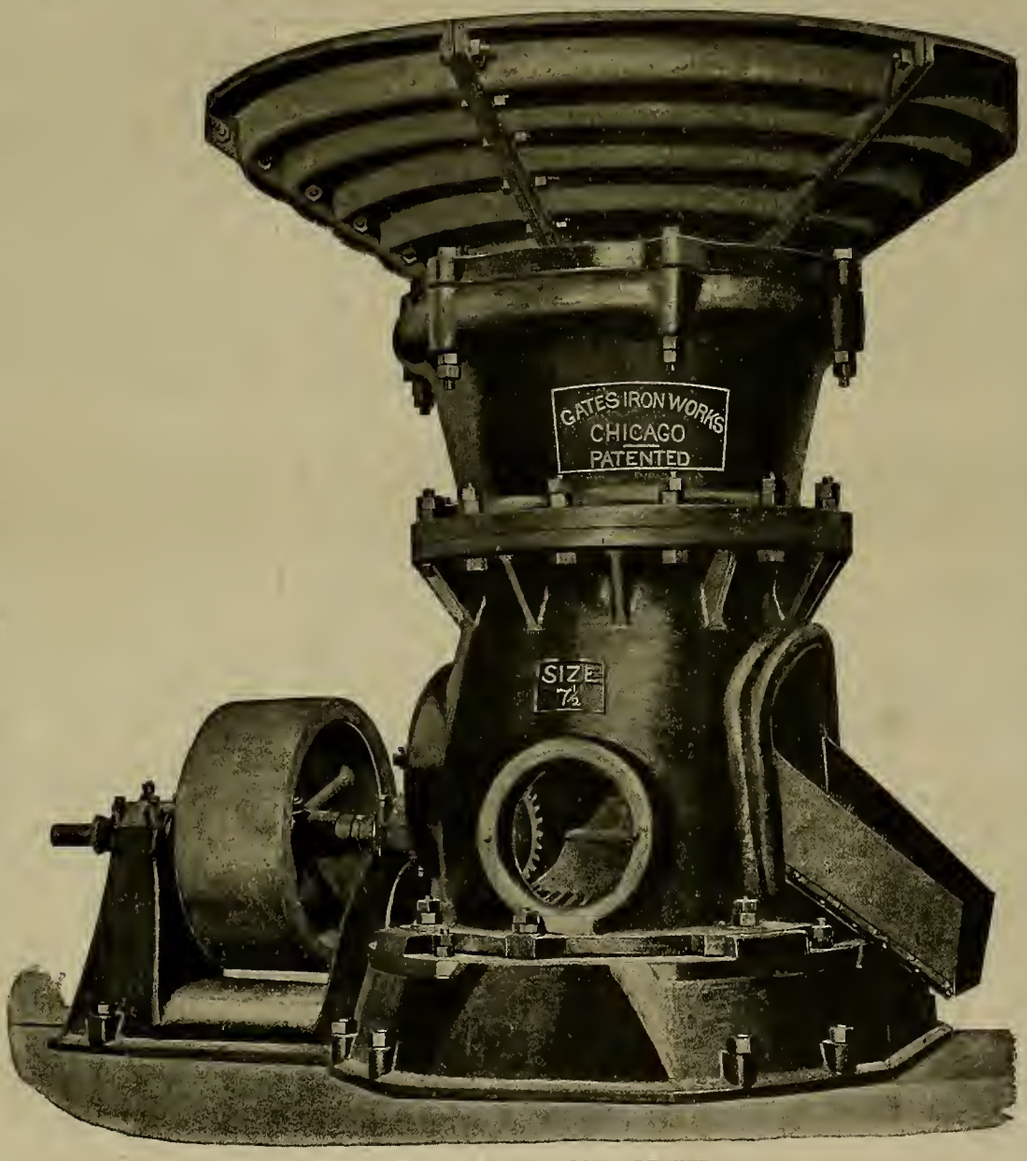
The following permits were granted: To E. P. Hager and Samuel Peck, to erect three brush dams six feet high at the U. S. Grant mine, near Blue Tent, Nevada county; to Johu Black, to ercct two brush dams six feet high at the Spanish John mine, near Rougb and Ready, Nevada county; to tbe Good Hope Mining Company, a log and crih dam forty feet high and forty feet wide at the hottom at the Richmond Hill mine, near La Porte, Plumas county; to J. M. Read and N. E. Beckwith, log and crib dam fifteen feet high at the Hidden Treasure mine, near Pine Grove, Amador county, and a hrush and stoue dam fifteen feet high at tbe Pine Grove mine.

ALLEGED "patent lawyers" in Londou have heen so actively swindling Americans tbat U. S. Minister Bayard bas warned inventors in this country to be wary in dealing witb Londoners who profess ability to secure Englisb patents.

EVERYTHING augurs well for a renewed interest in Califoruia mining operations during the coming year.

The Gates Ore and Rock Crusher.

Herewith is illustrated an improved form of tbe Gates crusher which for many years has held prominent place in machinery of this character not only in tbis country hut abroad, and may be considered as representative of the best type of construction yet devised for machinery of this character.



THE GATES ORE AND ROCK BREAKER.

The capacity of these machines ranges all the way from 2 to 150 tons per hour — that bere shown being one of the largest — capable of crusbing the hardest material at the rate of 150 tons per hour. This size machine is used principally in tbe large smelting and iron ore furnace plants of the East, as well as for macadam or road work. No other crusher, it may be said, bas ever heen found to stand the severe strain to whicb tbcy are subjected in handling tougb iron ore and bard blue tap rock. The sizes most commonly in use on this coast range in capacity from 1 to 20 and 30 tons per hour. The advantages claimed for these crushers are great economy in power as well as fineness and uniformity of product, its capacity for fine work being a consideration of importance in quartz mill work.

The rougber work being done by the breaker, saves the wear of the mill, whicb is hy far the most expensive part of the equipmeut, while the increased fineness adds to the output of a mill without auy corresponding increase in cost. Most of the sizes will produce a product fine enougb to pass through a one-half or five-eigbtbs inch ring, while a considerahle part will be fine enougb to pass a 15 or 20-mesh screeu.

The Treadwell mill, in Alaska, bas recently installed two of these machines, having a capacity of 1000 tons per day.

The Pelton Water Wheel Co., 121 Main St., this city, are tbe general agents for the Pacific coast.

THE work of the convention is by no means over, though tbe session bas ended. The Exccutive Committee of the California Miners' Association must now carry out the conclusions of the convention.

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Our latest forms go to press on Thursday evening.

Entered at the S. F. Postoffice as second-class mail matter.

J. F. HALLORAN.....General Manager

San Francisco, December 1, 1894.

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THE gold mines of tbis State have probably increased tbeir product from two to three million dollars over last year's output.

As soon as the water season commences some of the hydraulic mines which have built impounding works this year will commence operations under the new conditions. Most of them are confident of success.

"MACHINERY" aptly says:

"Write-ups" are the curse of trade journalism, for they never contain any news and seldom any information. They are mpositions on the good faith and good nature of the men who buy the paper for news, and they are tokens of dry rot wherever they appear. Beware of papers that are liberal with "write-ups." Space in them is of little value or it wouldn't be given away.

THE remarks of State Mineralogist J. J. Crawford on the mining statistics of California, made before tbe Miners' Convention, are omitted from the printed proceedings. Owing to the absence of Mr. Crawford from the city, we did not care to priut his speech until it could be revised by him. Prof. Christy's paper is also omitted, but will be published in a future number of the PRESS.

ONE RESULT of the recent Miners' Couveutiou has been to awakcn a reuewed interest among the people of this city and State; in the mining industry of Califoruia. They have been made to see that the mines are an important factor in our industrial advancement, aud that the miners should be encouraged in their efforts to rehabilitate their industry and increase the output of gold within our borders. Tbere is now a very different sentiment with regard to mining from what there was a few years since. It was at one time looked upon as a merely speculative sort of affair, but is now properly recognized as a legitimate busiuess for safe investment. Thc people of California will in the future do more for tbe miners than they have been doing.

WE devote most of our space this week to concluding the account of the proceedings of tbe State Miners' Convention. The speeches and papers have been given practically in full, with only one or two exceptions, so that those at a distance in the mining regions, who were unable to attend, by readiug this account may know what was said by those appearing before the convention. The results of this session were advantageous in many respects. The wants of the mining commuuity have been formulated and will be brought to the attention of Congress in due time. That body is slow to move in making changes affecting the great industries of the country, of which mining is one, yet energy and persistence on the part of petitioners who only want their just rights is bound to win in the end.

STATE MINERS' CONVENTION.

Proceedings of the Annual Meeting of the California Miners' Association.

(Continued from last issue.)

Congressmau A. Camiuetti was called upon to address the convention and said:

Mr. Chairman and Gentlemen of the Convention: I am pleased to have the opportunity to appear hefore you upon this occasion, not for the purpose of making any extended remarks or giving any suggestions or advice, but as au humble memher of the convention, for I hold a seat in this convention as a delegate from the county of Amador, and as your retiring memher of Congress from the Second District to make a sort of report of what has heen done upon the mining measures.

Before I start upon what I wish to say in that regard, I desire to say that, although your Committee on Resolutions has not yet reported, and your Committee on Legislation has not as yet filed its report, I was told, "How do you expect to say anything ahout the mining issue or about what is to be recommended hy this convention, when the reports of these two committees have not been presented?"

I want to say to the memhers of the Miners' Association assemhled here to-day that I have the utmost faith in whatever you do here on this occasion as heing hased upon justice, equity and right, and that there is no resolution, no action that the convention may see fit to take in its collective wisdom upon these questions that I do not support and uphold. It is not necessary that I shall see the report of your two committees upon that subject.

Now, hefore we go on: We have established landmarks of late years upon the mining question, and I know of no people upon God's footstool who have more appreciation and a higher sense of gratitude than the miners of this country, and it may he well to remember the starting point of all of this work. And to the convention which met in the city of San Jose in 1890 helongs the credit of having presented the first resolution in this State incorporated into a political platform, which came out manfully in favor of the rehahilitation of hydraulic mining in the State of California.

Now, in relation to the bill of 1892, I want it distinctly understood, and you will pardon me if I am a little personal in reference to an act that in some quarters of the State, wherever that hill has worked well, it has heen called the hill of somehody else, and wherever that hill has heen wrong and worked harm it has heen called my bill. Now, I want it distinctly understood hy the people of California that that bill as originally introduced hy me, with one solitary provision which was not mine, was my work, and that no living man ever saw it until I read it to the distinguished committee which you sent from your convention to the city of Washington. That provision was the three per cent tax. I had nothing to do with that and do not claim it, hut the balance as presented hy me is my own work. I am willing to assume the responsihility of its failure or whatever it may hring ahout in this State.

Now there have heen some other matters hrought hefore this convention, and at all times I have attempted to follow the request aud the resolutions which you have sent m to Washington for us to act upon. I believe I followed your wish when in the halls of Congress we hrought up the mining hill that you have before you to-day, as one of your laws. The penal clause was added to that—this is another thing I had nothing to do with—it is not mine. Those who desire further information upon that can get it hy looking at the record. That was not my provision. I was against the penal clause and fought against it to the last. And your own representative sent to Washington upon that subject, when he left there, authorized and I have his authority to accept the hill as amended hy the Senate. Hence, if you have any fault to find with the penal clause in that hill, do not hlame me. You will find some one else to blame. I followed the instructions of your committee in accepting that hill as we were compelled to accept it.

Another thing: You passed resolutions in favor of certain mining legislatiou; I did not introduce the whole of the hill as presented, hecause I feared that if you presented eight or ten long sections, that it would he almost impossihle to secure consideration. The material provision in those resolutious, however, that in relation to contests between miners and agriculturists, I did iutroduce, and upon that I desire to give you the history of the work that was accomplished in the last session of Congress.

I introduced hill 4402 upon the subject regarding the recommendatious made hy the convention. We went hefore the Committee on Mines and Mining. Here is the original hill I introduced to carry out identically the provisions recommended by this convention a year ago. I left out the balance for reasons already stated. Mr. Newlands introduced it in the House and Senator Stewart introduced the original Stewart bill in the Senate; that passed the Senate and is now pending in the House of Representatives hefore the Committee on Mines and Mining. After the committee organized, I appeared hefore them in relation to this measure. I found two or three gentlemen, members of the committee, who were from farming sections of the United States, and they said openly that I was trying to do something for the miners of California, as against the interest of the farmers of the State, aud they antagonized the measure in four or five sessions of the committee. Fiually I suggested, seeing we could not get harmony—Mr. Newlands was present at those sessions, aud will hear out what I say—finally I suggested that the hill be referred to the Secretary of the Interior for his recommendation, and that was adopted. I appeared hefore the Commissioner of the General Land Office upon the subject, and found after considerahle discussion that he was against the hill, and he made a report, which I have here, against all the provisions of the hill as adopted hy the Miners' Convention. It is too long for me to read at this time. I will leave a copy of it with the Association so they can see it. Here is the recommendation of the Commissioner of the Land Office, defeating entirely the wishes of the memhers of this convention, and the people of California, as I understand them to he. Finding the Commissioner decided against it, I then went to the Secretary of the Interior and asked permission to have a hearing hofore him or hefore any law officer of his department, in whom he had confidence. Finally, the Secretary of the Interior appointed one of his trusted counsellors and advisers to consult with me upon this question. I had three meetings with him, and finally I succeeded in getting from that Department a recommendatiou overruling everything that the Commissioner of the Land Office had done with relation to this hill.

I concurred generally with the views of the Commissioner, with the modification and amendments recommended in his report, hut I would suggest that the proviso in the nineteenth line, which is the part in relation to contests hetween miners and agriculturists, that the proviso in Section 9, page 5, nineteenth line, be amended to read, "Provided that the presence of rock in place, hearing gold, silver, cinnahar, or nther valaahle deposit of mineral, shall he regarded as prima facie evidence that the land adjoining the same is, and always has been, mineral in character, provided, further, that in investigating the character of land with a view to ascertaining whether it is more valuable for mineral or agricultural purposes, evidence may he taken of the mineral discovered or developed adjacent to such land, proof of which shall he presumptive evidence that the land in question is mineral in character; provided, further, that wherever land is in a well defined mineral helt, it shall he prima facie evidence that the land is mineral until the contrary is proven."

One object I had was found in this expression: "Bearing gold, silver, cinnahar or other valuable deposits of mineral."

The Commissioner of the Land Office laid stress upon the fact that the law we were seeking to embody into the Statute enahled any miner who might find some little mineral to get a patent to his land, and yet the claim might not he a valuable one. I could not succeed in convincing this officer that that part of the law should he overruled. But if you will take the law as passed hy the House of Representatives you will find that that is changed hy the House, and that the law reads, as passed hy the House: "In cases of contest as to mineral or agricultural character of land, the testimony and proofs may he taken under such regulations and notice as the Commissioner of the General Land Office may prescribe, provided that the presence of rock in place, or deposit bearing gold, silver, cinnahar, or other valuable mineral." It did not require it to he a valuahle deposit or a valuahle mine, hut that you have found upon it valuable mineral.

Now, regarding the quantity. That has heeu a great question. Those memhers of this convention who have practiced before the Department and hefore the Courts remember that the great stumhling hlock has heen in these contests hetween agricultural and mineral claimauts, and hetween the railroad in the Second District and the mineral claimants; that they always succeeded in overcoming the mineral claimants on the ground that they had not established the existence of a valuahle paying mine. If we can overcome that ruling hy law, and prescrihe in the law that it shall he the evidence of a claim having valuable mineral, we can settle the question in my judgment. If I am wrong I would like to he corrected hy those who have had more experience in these matters, hut from the stress laid upon that subject by the Commissioner, who dwells in five or six pages on this matter, upon that very question, wherein he says that if a miner finds five dollars worth of gold upon his claim he would he entitled to a present, I said, "If there is no gold at all, how can you tell that by prospecting the work he will not find a valuahle claim?" If a miner is willing to spend his time and money and pay douhle price for the land, why should he not he given an opportunity to develop a claim? I showed to the satisfaction of the Secretary of the Interior that the rulings of the Department, as they have ohtained for the last 10 or 12 years, would have lost a patent to a thousand valuahle mines in this State to-day. One of the best mines in the State—some people are here now, and I see one hefore me, interested in that mine who will hear me out—Mr. Reichling of the Kennedy mine. Under the rulings that the Commissioner wants to establish in this country; at the time that the Kennedy mine was patented, that mine never would have beeu patented, and yet to-day we are in Amador proud to say that we have one of the richest gold producers in the world. Such was the case with the Plymouth mine in our county, producing nearly $6,000,000 and never showed a speck of gold until they got down 1180 feet. In this experience I succeeded in overruling the Commissioner.

MR. SHERWOOD: Mr. Chairman, I have got to go home this evening, and I want to make a few remarks, if the gentleman will allow me to do it. I am told by the chairman of the convention, who has just left here, that a resolution has been introduced there endorsing the work of the Commission, provided for by the Caminetti bill. Am I right about that, Mr. Chairman?

THE CHAIRMAN: You are.

MR. SHERWOOD: Now, sir, I had intended—Mr. Caminetti, will you excuse me?

MR. CAMINETTI: Yes, with the utmost pleasure.

MR. SHERWOOD: I came here as the representative of Nevada county, because the gentlemen who appointed me to the Miners' Association of Butte county asked me, before I was appointed, if I would serve. I said, "Yes." There never was a time in my life when I have been able to talk that I would not express my opinion, and I am here for that purpose now. I had intended, as I said to Mr. Cross and to Mr. Caminetti to-day, to introduce the resolution endorsing the work of the United States Debris Commission provided for by the Caminetti law, and I want tbis conveution to endorse it—I do not waut to hear a voice raised against it. We of the valleys have got cranks among us; and you of tbe mountaius have cranks among you. But, sir, the couservative element there means exactly what that law means.

THE CHAIRMAN: Mr. Sherwood, the resolution introduced here, endorsing the action of the Debris Commissiou, did not take the course it was intended all resolutions should take, but I will, out of courtesy to that Commission, say that it was passed unanimously without reference.

MR. SHERWOOD: I supposed this convention would unanimously listen to me a few minutes, because Mr. Caminetti is willing. I do want to see that work endorsed; I want to see it going on because it is doing right. It is doing good to the miners, it is doing good to the farmers. It is saving us in the valley thousands and thousands of dollars that we have paid to lawyers. While the lawyers may be honest—and I have never seen a lawyer who was not honest—I believe like my frieud Mr. Fairchild, who stumped the State with Mr. Estee, that "we have got tired waiting." I believe tbe lawyers are generally good men, but like the orators that are hired to tell their story, they sometimes make a mistake, and as sure as you and I live, Judge Cadwalader and Judge Wallace—they are like twiu peas in a pod—meant well, but we got left, and you fellows got along all right. The North Bloomfield Company, after six years of litigation, were fined three times. Hayward's fees amounted to $2,750. Why, they stood and laughed. Wben we sent out spies up there—you fellows called them spies, we called them gentlemen—we said,

"Stand back and watch the monitors by the moonlight." They paid $2,750 in six years—it was a license to run a big mine and every small mine in the county of Nevada was shut down, because they could not afford to fight it in the courts. I want to see this convention endorse the work done by this Commission because I know it is right. The people of Marysville endorse it almost to a man.

MR. CAMINETTI: Mr. Chairman, I am glad to have the distinguished gentleman from Yuba county make the statement he has here to-day, for it shows that the miners and valley people are at least upon friendly terms and are willing to move on to a prosperous future. As I said just before Mr. Sherwood asked permission to speak, the Secretary of the Interior finally overruled the action of the Commissioner. Before acting upon it, however, being called to California upon matters of another nature, I attempted to see as many of the Executive Committee as possible. I believe I met in this city my friend Scarles of Nevada, who had proposed this proposition in the Executive Committee of the Miners' Association, and I submitted to him the action that was then agreed upon by the Committee, and he looked over the bill and thought that was the best we could do—that that would be satisfactory. He had been engaged in cases that this question had risen in and said that that would cure all of the defects, in view of the fact that the Supreme Court of the United States had enunciated and determined so freely as they had. On returning to Washington I went before the Committee again, and that Committee made a report, a copy of which I have here with me, recommending the passage of the bill as agreed upon by the Secretary of the Interior, changing, however, that expression that they desired, "Other valuable deposits of minerals," to the wording as found in the law, "Or other mineral," so as not to require the miner to prove that he had a valuable mine before he could get a patent on it.

That law was brought up in the Committee. The first time it was objected to under a misapprehension of the facts. Then it was called up again and passed without trouble. It is now pending before the Senate Committee on Mines and Mining, Senator Stewart being Chairman of the Committee at the time it went over to the Committee. The two Houses were engaged in the tariff discussion, and nothing was in order except the solution of that question. The Senator thought to attempt to pass that hill at that time might endanger its passing. He advised that we wait until the re-assembling of Congress in December; then, he said, we would call it up and have it passed. I will leave a copy of the bill as it passed the House, and the original copy, and I desire to have them look into the matter, and to make such suggestions as they deem proper to be made. I am endeavoring, as one of the delegates, to do my share as to carrying out the will and wish of this convention upon that matter.

There is another matter that I think this convention ought to take immediate steps upon; and it is important, for, after you pass this law, you do not win this fight unless you take other steps. The great trouble, as I have found by correspondence with people who reside in Placer and Nevada, and along the line of the Pacific railroad grant, is that today patents are being issued to the railroad for lands that actually are mineral and ought to be given to the miner. Unless you stop that work, you will lose the opportunity of getting the valuable mines that are now upon this land and have caused a great deal of trouble.

Before leaving Washington after the adjournment, I called upon the Secretary of the Interior and obtained from him the figures: The total amount of the Southern Pacific land grant in California was about 1,638,000 acres. Up to that date—June 30, 1894—491,000 acres were patented, and on the same date there were pending selections already approved by the officers, and only awaiting final decision of the Secretary to be patented by the President of the United States—414,500 acres—and the balance not as yet located and surveyed amounting to 732,000 acres. Now, while you people are waiting, while the people throughout the district are doing nothing, the Southern Pacific Railroad, by its army of officers, by its army of perjured witnesses, is going around the district and in the land offices in this State and in Washington robbing, from the people of this State and from the miners, the land that belongs to them. Now, you can do more good upon this question by appointing a committee to take such steps here in this convention as will stop the further issuance of these patents that are now awaiting the approval before the Secretary of the Interior. That is important work for you to do, and one-half of the battle can be won right there if you do but take hold in earnest and pursue the subject—414,000 acres in the mineral belt now by perjured testimony in half of the cases, I have no doubt, awaiting approval in order to be patented; and once patented, no matter what the rights of the miner may have been, it will be too late then to sue and pass resolutions denouncing this, that or the other.

Now is the time to act, and I hope that this convention, holding the interest of the miners of Nevada county, Placer county and the adjoining country at heart, will take immediate steps to call upon the Secretary of the Interior, by resolution sent to him by wire, to hold back his decision until the miners of this State can be heard before these final selections are patented. I am but one member of the delegation—an humble member—but I promise you here now, Mr. Chairman, as I have promised you in the past, to be with you in everything for the good of the miner. Whatever I can do upon that, you can command me at any time as long as I am a member of Congress. If you need me after that, why command me, too, and I want no fee for my services either as an attorney or for my expenses in going to and from Washington. Now, I hope that some gentlemen of the convention will move a resolution upon this subject, and that some action will be taken on the subject of these patents.

I am not finding fault with the Receiver of the Land Office at Marysville, because I know that he is bound down by rules and regulations that he cannot shirk. What I have said does not apply to the officers who are doing their duty, but it applies to the chief officer who wrote this opinion and has seen fit to write opinions for your guidance which you are compelled to follow as an officer. You must follow them, or, if you refuse to follow them, you will be compelled to step out of your office. I am complaining against the departmental law that has been enforced in Washington by some of the officials. This is one of them; and under this departmental made law, against the spirit of our laws, against the spirit of the mining laws, it has been intended to give to this corporation lands that do not belong to them—lands that by this decision of the Supreme Court of the United States is plainly said to belong to the people, and any attempt to wrest it from the people by the means that they have resorted to is illegal and a fraud.

If I can get a resolution passed, calling upon the Secretary of the Interior not to issue another patent until the facts are brought before him, I know we will get a reservation of many of these patents now awaiting approval. I have not the time to go through this decision in the case cited by Mr. Ricketts yesterday. The decision is an important one and makes plain our duty, and makes plain what the law is. It might have been declared that way years ago. New light is breaking and at last the people are coming into their old heritage. The corporations have been notified by the Supreme Court of the United States, not only in this decision, but in others, that they must stand upon equal footing with others in the community. This decision here written by Judge Field sets forth all these facts and makes our duty plain.

There are a number of questions I intended to touch upon, but I know if I keep you here long I will interfere with other duties, so I will bring my remarks to a close by making reference to one or two provisions of the Debris bill now in force. I think in the operations of that law, that we really have not given a fair chance to the Mining Debris Commission to put the hill to full test as yet. I am glad to see, according to the report in the newspapers yesterday, that at last we will have a practical test—where the seventeen hydraulic miners of gold have united in asking this Commission for permission to jointly build a dam. That is bringing the bill to a test. We have not really given the Commission an opportunity to say what they would do, or to see what the law would do by way of settling this great question. I hope there will be an opportunity given to you, gentlemen, to put the law to a test. They are able men. We all have confidence in their integrity and ability; and we but need to give them an opportunity to put the law to a test to see that the laws that we now have are really sufficient, with such suggestions as may be necessary by way of amendment, to bring us to a solution of this question upon the ground of entire fairness to all interests, and of entire protection to the valleys and to the rivers.

This is my proposition: You know that you have upon the Sacramento river thousands of acres of lands that are useless for any purpose except to raise mosquitoes and produce malaria. Now, then, it seems to me it would be an easy matter to get the consent of the owners of those lands for the purpose of using them to dump upon; it may be a useless task, but it is worth trying. I think if you were to appoint a committee for the purpose of investigating this question and seeing the owners of the American basin—

THE CHAIRMAN: If you will allow me to inform you, Mr. Caminetti: We have a State Commissioner of Public Works, who is investigating that matter thoroughly, and we are expecting an address from him at this convention.

MR. CAMINETTI: That would be one part of the work, and I am very glad to know that Mr. Rose, as a representative of that interest, believes that that is a practical idea, and that it can be successfully worked. That is what I have understood his views to be.

In conjunction with him, if you appoint a committee representing this Association to investigate this matter and consult with the owners of the American basin, where there are one hundred square miles submerged most of the time and fifty square miles submerged most of the year, and also other tracts in other sections of the Sacramento river, and then appear before the Mining Commission and ask them to establish the harbor lines, as provided by the law of 1886—why, it seems to me that you will solve an important question in the direction of enabling the rehabilitation of many of the mines that now cannot work in the San Joaquin river. There has been but little injury done by the working of these mines, and those of you who know the great amount of mining done in the southern mines, know there was a great deal of material that ran down from Calaveras, Tuolumne and other sections into the San Joaquin, and yet mining has done no injury to that river, because on the way down from the mine to the river this material did not go down by an open channel, as in the Yuba, Bear and American rivers, but, by passing through great tule beds, it has been stopped on the way, so that by the time the water reached the San Joaquin river it was in a pretty clear state. Nature has pointed out to us what to do on the Sacramento river. You have there the sands of acres of tule lands situated in a way that you can utilize them as the tule lands on the San Joaquin were utilized, so as to prevent damage to the river.

Congressman E. F. Loud then addressed the Convention, saying: "It did not need the admonition of the convention to tell me that there is a feeling among the gentlemen of this convention, or a desire, rather, to get down to their work, and to return to their homes as soon and as speedily as possible. Understanding that, I shall detain you but a very few moments. In the early days before the war, I did a little mining in this State, but that is so long ago that my hands have become so softened of late years and my body so weighty that I find that I would make but a poor miner to-day. It is for you, as representatives of the mining interests of this State, to formulate such instructions and such resolutions as will seek to guide us in the halls of Congress in forming such legislation as will redound to the credit and to the interest of the State of California.

I have heard discussed here this afternoon the iniquitous decisions of the present administration. Being a Republican, of course some time ago I thought we should have a change of administration, but, hearing it from the lips of an old Jeffersonian Democrat this afternoon, I have become more firmly convinced than ever that we should have a change at least, in the Interior Department —

MR. CAMINETTI (interrupting): Mr. Chairman: I think the gentleman is going outside of the bounds of this discussion. I want to tell you that it is the Commissioner of the Land Office who has decided wrong, and that our Democratic Secretary of the Interior has overruled him.

THE CHAIRMAN: Gentlemen, it is very improper to bring politics into this body; I urge you at all times and upon all occasions to drop any reference to either of the great parties or to the younger party, the Populist. We are here for one common purpose, Democrat, Republican, Populist and Prohibitionist, all upon the same platform, working for the same purpose, and in my capacity as Chairman of this Association I recognize no man for his political convictions. I believe in every man working shoulder to shoulder with his neighbor, to carry this object that we are associated together for to a successful determination.

MR. LOUD: Mr. Chairman, I trust that I have not transgressed farther than those who have preceded me on political questions. Surely nothing that I have said has been said other than in a spirit of facetiousness. I do not desire to bring a political discussion before this body. Far be it from my intention.

More than $150,000,000 has been expended in the improvements of our rivers and harbors primarily, and having in view principally the object of giving the farmers of this country an outlet for the products of their farms. Now then, I believe that the same policy of protection should be extended to the mining interests, not only for the State of California, but for the whole far West. I am not here to dictate to or to advise you as to what you should do. Following out the policy that has been in vogue for many years, I believe that this country should expend money, that the gold hidden in the gravel should be brought to the surface. I believe that money should be expended upon our rivers, if it becomes necessary, that the miner may again go to work in the hills and bring from eight to ten millions of gold a year to put in circulation in this land.

Now then, to that policy I say steadily adhere in Congress. It is not necessary for me to pledge you here in my feeble way, for I have done all I could to further the interests of the miners in this State. The farmer cannot be successful until we shall dig from the earth money to put into circulation, that we can live in a civilized land and not go back to the days of poverty.

I cannot pledge you that I will carry out every proposition, possibly, that you may advocate or endorse, but I pledge you here and now, I shall in the future, as in the past, advocate such measures as will allow again the miners in our hills and in the mountains to go to work and make our land rich and prosperous.

SECOND DAY—EVENING SESSION.

The convention was called to order for an evening session on the second day, President Neff in the

chair. The president stated that Judge Searles had been invited, and had consented to address the convention on the subject of "The California Miner." Judge Searles then came forward and addressed the Association as follows:

Mr. President and Gentlemen: It is true that some time since I was invited to prepare a paper for this convention and was given as a subject "The California Miner." It was a subject that was congenial to me; a subject concerning which, notwithstanding my limited knowledge, I believed that I knew something. Having slept with them, having run with them—having done a good many things with them that perhaps ought not to have been done, as well as some that were highly meritorious, I found that from my opportunities of observing and from my experience I was somewhat familiar with them. But my conception of the California miner is so high, and my admiration for him is so great, that I could not consent to do anything of the kind without giving such attention and time to the subject as I thought due to the California miner. Being compelled to work all the time and being overwhelmed with work, and having had no opportunity to devote any attention to the subject, I therefore respectfully declined.

Having put a veto on that matter, there is not much else I can say to you, for the reason that I have not been with you during your councils, and I am not to any considerable extent aware of the subjects brought before you for discussion. You all know that a man cannot tell a good story until he has heard two or three, and then the storehouse of his knowledge on that subject is opened up before him. So is it with speaking. We want our feelings, our minds and our hearts to be wise, and we want to take an interest in it; and if the audience is sober we want to be sober also.

It seems to me that California has exceeded herself in the personnel of this convention. I have no desire to flatter you old baldheaded fellows; but in point of intelligence it seems to me that this convention vies with any like convention that has preceded it. Therefore we may hope that in your deliberations great good will result. From the reports that I heard of your afternoon proceedings, I think that if any of us were to get out of order, our good president will quickly call us to account. I am told that he "speaks right out in meeting" if he has anything to say. I shall keep within very narrow bounds therefore. When your Committees on Resolutions and Legislation have reported there will be something to think about, and when the majority are thinking the minority are very much inclined to talk.

THE PRESIDENT: I see that we have preseut Mr. A. H. Rose, our State Commissioner of Public Works, and we will be pleased to hear from him.

Mr. Rosc then advanced to the platform, was introduced to the Association by the president, and made the following remarks:

Mr. President and Gentlemen of the Association: It is not my purpose to make you a speech to-night. If I were gifted as Judge Searles is, it would give me great pleasure to talk to this Association. I believe that there is much to be said, much that is of interest, and much that would be valuable to the gentlemen here assembled. I am not, however, gifted in that way. I am not in the babit of making speeebes. I was many years engaged in the occupation of mining, many years ago, and I have not lost my love for the mines or the miner. My sympathies are largely enlisted in the business in which you are engaged. I am a valley man, by the way, and have lived in tbe valley for a number of years. Notwithstanding that, I think I can speak disinterestedly in what I may say, and what I will say will be, I think, for the benefit of both sides of this question, if one can say that there are two sides to it. I think, however, that there is but one side to tbe question on which you are assembled.

I recognize the fact that at this time money is what California and the country adjacent to it most needs. I realize tbat money is nearer the reach of the people of tbis country through the miners than any other source that can be made available within the next few years, or perhaps a great number of years, and if feasible to make hydraulic mining yield as it once did to the miners. I assure you, gentlemen, that anything that lies within my power will be given to aid you. That will not be much, but whatever it is, whatever it is worth, is yours.

For a period of about a year and a half I have been engaged in examining the question of the drainage of the valley, for the purpose of reclaiming the large area of swamp and overflowed lands in the two great valleys of the Sacramento and the San Joaquin, or if you please, tbe great valley of California. In the course of my investigations I have conceived the idea tbat there is a perfect and an absolute solution to the difficulties existing between the hydraulic miner and the valley or tbe river people. If I am right in my ideas, tbe suggestions that I have to make to you may be worth something.

The American basin, so known, situated between tbe American river on the south and Bear river on the north, is a body of land tbat is now almost wholly worthless, covering an area of 110 square miles of territory and susceptible of being filled to a depth ranging from twenty to forty feet, as necessity might require, and in my judgment, as a result of the investigations that I have made, it is feasible to turn into that basin the Bear river, the Yuba river and the American river, thus making that basin a settling pool for the debris that shall come from the mines, and hy that means dispose of the question of hydraulic mining which has been in contention between the valley and the mountains.

That basin is capable of holding a very large amount of debris, if you will figure on it. If I am right the debris from the mines can be brought into that basin, the debris settled there, and the water passed out into the Sacramento river practically clear.

Would that be a solution of this question? It would dispose of the debris practically from all the hydraulic mines of this State. There has been no question so far as the southern part of the valley is concerned, and that has not been in contention. If this proposition is a sound one it would dispose of the question of all the hydraulic ground that is very important in the northern end of the State. True, it would not take care of the Feather river, hut the water of that river is to-day clear, and nobody complains of it. It would dispose of all in regard to which there is any contention today.

Mr. Cross told you to-day that he believed that there was as much gold in the hills of Nevada county alone as had been taken out altogether in the State of California since the discovery of gold, which would he about fourteen hundred millions of dollars. If there is half that much money in those hills it will pay to make this reservoir that I speak about. If there is a quarter that much money in those hills it will pay. If there is three hundred million dollars within the limits of Nevada county, by adding to that the adjacent territory it would be a paying proposition to make out of the territory I have described a reservoir that would dispose of this whole controversy.

You have entered upon a system of impounding the debris. It is done piece-meal all over your mining country, and it is more or less expensive. In the end you will find tbat you will spend two or three times as much in detail work as would be necessary to expend on this whole ground. It is not alone the taking care of tbe debris. If the valley is to be maintained, or if the rivers are to be maintained, it is essential to maintain the debris that is already in the canyons. Tbis proposition should effectually accomplish that result. For the accomplishment of this project there are no engineering difficulties in the way. I have employed the best engineers in the State and I have their unqualified opinion that no engineering difficulties whatever are in the way. The canal for the deviation of the Yuba river would be about forty-five miles long: the canal for the deviation of the Bear river would be about ten miles long, and for the American river it would be very short—probahly a mile or two miles. If that should he carried out it would forever, or for a time longer than the life of anybody within the sound of my voice, hold up the debris of all those rivers, and keep it out of the Sacramento river. It would improve and enlarge the carrying capacity of the river for the purposes of navigation, and he equally important for the purpose of hydraulic mining.

If this is a question in which both sides are equally interested, can it not be easily accomplished? In my study of the question I have thought so. I am about to make an estimate of the cost of such work. I had promised your Executive Committee an estimate of the same, and I will have it completed within a short time, and in accordance with that promise I will submit it to that committee.

You all know the great importance of the occupation of mining. You have heard more about that than I can tell you. You know it from your own people and you know it yourselves. You also know that the proposition of the clearing up of this question has been paramount within the mining region.

Mr. Sherwood of Yuba then made the following remarks:

The gentleman presents a proposition here that has never been before heard of in this country by either the United States engineers or the engineers of the State of California. I understand his proposition to be that the debris of the hydraulic mines should be deposited in the bay, or in the tule lands.

MR. ROSE: The proposition that I have suggested is to deposit the debris iu what is known as the American basin. There are no intervening rivers to prevent the accomplishment of the result, and as I stated it is a territory embracing about 110 square miles. There is abundance of fall. On Bear river there are some six feet to the mile. On Yuba river from Point Daguerre to the point of out-fall the fall is nearly four feet to the mile. That is ample for all purposes required. I am willing to stake my reputation on that proposition.

MR. SHERWOOD: This is a matter of demonstration, and you are in an official position to demonstrate that fact. I want to say that it has never before been asserted as the solution of hydraulic mining that it can be carried on by permitting those that manipulate it in auy shape or form, whether it be by foreigners or our men at home, to turu their talings and dump it into the tules that adjoin land of mine. There is no equity in this. While the gentleman represents a part of the valley, he does not represent the sentiment of the valley when he says you can turn your tailiugs in on my home and make it a soil on which to grow grapes, turnips or anything of that kind. We want this thing to be determined under the Commission, and I appeal to Mr. Rose and to these gentlemen on that. Hydraulic mining can be carried on under this Commission. If I am not mistaken, Mr. Rose is opposed to this Caminetti bill and this Commission.

MR. ROSE: As to that, you are entirely mistaken from first to last. I have recognized the Caminetti bill from the first as a measure that was proper and desirable, and which is accomplishing a great deal of good. In presenting this proposition I only presented the physical features of it. I did not go into the details of how this was to be accomplished. I did not say it was proposed to be taken from the owners of the land for this basin. Of course I understand that if the land is to be taken from the parties who own it, that they should be compensated. No commission has yet reported upon this subject, but I say I have examined the proposition with as good engineers as there are upon this coast, and I say it would be a solution of the proposition if carried out upon those lines, and it would then go along as it did before there was any litigation on the subject.

Mr. Caminetti then made the following remarks:

During the last session of Congress an arrangement was made to bring out the Committee of the Lower House in order to give them an ocular demonstration of the building of a dam at Daguerre Point. I telegraphed to Mr. Rose and to the Miners' Convention, telling them that the House Committee was ready to come. Mr. Rose immediately telegraphed me saying, "How much do you want to bring out that committee?" I answered that I thought about $3,000 would do it, and Mr. Rose at once answered, "Draw on me for $1,500 to do that." I know that he speaks from the bottom of his heart. I telegraphed the other members of the committee, but I got no response. If I had gotten that I think we would have secured the dam at Daguerre Point, Mr. Chairman.

THE PRESIDENT: I see in this body an honorable and distinguished member of Congress, Mr. Francis G. Newlauds of the State of Nevada, and I ask him to come forward and address you.

Mr. Newlands advanced to the platform, was introduced by the chairman, and made the following remarks:

Mr. Chairman and Gentlemen of the Association: Two years ago I had the pleasure of addressing the members of the Mining Association of California, just after I had been elected to the Congress of the United States from the State of Nevada. I promised then that I would do everything that I could to advance the mining interests of California, and particularly hydraulic mining. Since that time the Congress of the United States, to which I belong, has been convened in one session of almost a year in duration. The main purpose of this Congress seems to have been to subject us first to financial impediments, making us dependent upon foreign countries by impairing our rights to resort to our own mines for money, compelling us to resort to the humiliation of stored gold in the foreign countries, and secondly by subjecting us to the industrial stress in foreign countries by a certain industrial stress witb which you are all familiar.

A bill has been introduced in Congress bearing my name for which this Association is really responsible.

With reference to this bill I will say that I am in full accord with all of its provisions, and that it has been fully considered in the Committee on Mines and Mining, of which I am a member. Most of the members of that committee come from the Eastern and Southern States, and when I say Eastern States I refer to that part of the country east of the Missouri river.

I am glad to say that that law recognized the importance of the mining industry. During that session, under the instructions of Mr. Caminetti and myself, the members of that committee have developed into pretty good miners. I believe tbat there exists in that committee a sentiment which will he in the main favorable to the bill which you have elaborated. I shall be glad to have the assistance of Mr. Caminetti at the short session of this Congress. I recognize in him one of the ablest and most pertinacious members of the California representatives. I only regret that at the following session of Congress we will not have the benefit of Mr. Caminetti's labors and assistance.

You are doubtless awaie that one of the purposes of this hill was to exemplify the proofs that a miner has to make to his claim that is contested. With reference to that we have found considerable difficulty in impressing the farming and agricultural sentiments of the Eastern and Southern States in the committee. You all know of the decisions of the Land Office, given as a rule by clerks, men who are unfamilar with the mining regions, and the presumptions which prevail there are very unsatisfactory, and an effort bas been made in this bill to determine the rules of evidence which shall control these mining contests, and to determine the presumptions clearly and conclusively of mining helts and regions in favor of the miners. The sentiment of the Land Office has been against that, and the sentiment of the average farmer in Congress is against it, for they say, "Why should not the rules of evidence be left according to the hooks, and why should they he laid down hy an Act of Congress with a particular intent to affect them?"

It is possible that there may he a hill introduced in this next session aiming in that direction. But I wish to say to you that a wise solution of this proposition would be to submit all these contests to the court, and to take away entirely from the Land Offices and the Land Office at Washington the determination of these contested questions. Then the mining contestant will have justice, even though the rule of evidence be not declared in the law in his favor. We all know that a rule of the vicinage prevails in all contests. The sentiment of the neighborhood prevails in all these contests. And in the region which constitutes clearly and unequivocally the mining helt the presumptions will be in favor of his claim. I therefore suggested to the committee of the Miners' Association that they should take this matter under consideration, this question of the Newlands' bill, with a view to settling all these disturbances.

I can only reiterate what I have already often said, that I stand in Congress as the representative of every western interest, without regard to State lines; that I believe thoroughly in the development of the mining interest, which I believe to-day stands as the basis of all civilization; and I stand ready to do everything I can in Congress to advance that interest.

I believe that a man or a community or a State that impedes for one moment the production of the precious metals, either gold or silver, commits a crime against nature. The production of the precious metals not only adds to the productive wealth of the world, but also increases the volume of the medium of exchange that is facilitating all the business transactions, sustaining and even raising all the land. It is not merely an industry, it is a benefaction to mankind.

My friends, I believe that the money of the constitution is gold and silver. I believe in primary moneys. I believe in the precious metals, gold and silver, which, as John Sberman declared some years ago, were ordained by God Almighty as the money metal of the world.

You are too peculiarly interested in the question of gold not to be insensible to your friends to the east of you, who are more interested in the production of silver. History records the fact throughout the ages that civilization has advanced whenever the mines were productive, and that it has declined whenever the mines failed to yield. Thoughtful men, tbe philosophers and historians of the world, have declared that the periods of barbarism, the dark ages of the world, have been created by the loss of the precious metals. Up to 1873 tbe products of the mines were welcomed by all humanity. Whenever the mines produced more freely of gold, or more freely of silver, whichever the case might be, the increased output was welcomed as an advance of civilization, and the revivifying effect was felt of prosperity, of happiness and general civilization.

There has been no epoch in the world so fruitful of advance, so fruitful of prosperity, so fruitful of general effort and general happiness as the epoch of the world after the discovery of gold in California and Australia in 1850. It remained for the financiers of this, the nineteenth century, in the year 1873, to put an artificial shrinkage upon the production of the precious metals. That restraint was placed upon the public in this, the country devoted to freedom, to liberty, to advancement and to civilization. In 1873 the United States took the lead in the attack upon silver. God knows how the fatal Act was inspired or where it originated, but no greater crime against the advancement of civilization has been committed.

Had this country in 1873 heen a colony of Great Britain, and had Great Britain then declared by law, or by edict, that the silver mines of America, then abundant in their richness, should he closed, and that not an ounce of their silver should obtain access to the mints of the country and be turned into coin, the people of the English colonies would have met Great Britain with arms in their hands. By stealthy legislation, the history of which no man is able to place, by a bill which the legislators who passed it were unconscious, of which the President who signed it knew nothing of its fatal contents, silver was demonotized. It was not only denied legal tender, but the people of this country, the owners of bullion, were denied the privilege of taking an ounce of their bullion to the mints of the country and have it turned into coin. Then commenced that agitation with which you are all familiar, an agitation lasting from 1873 up to the present moment. Distinguished by two advances in progressive legislation, one the passage of the Bland Bill and the other the passage of the Sherman Bill, both falling short of the recognition of silver as a metal, but both progressive in their character. At the last session of tbis infamous Congress of which I am a member, every vestage of legislation providing for the use of silver was stricken from our statute book. And to-day no owner of silver bullion in tbis country can take an ounce of it to the mint of the government and have it turned into current coin. We have thrown ourselves upon the mercy of foreign countries, notably of England, which through its system of manufactures and commerce has accumulated the gold coin of the world. We have now to go to that country from whicb we, in 1776, declared our independence, and upon bended knees pray for the gold essential to our existence.

Now my friends we propose to right this wrong. Even though we have to destroy the two existing great parties of the country. It is history to do it. I believe in a true American policy. I believe that the mining of the precious metals is the most important industry in this country. It is important simply as an industry, for it involves one-third tbe area of the entire country. It is important also because it gives an annually increasing product to that money volume which is necessary to the increased product and prosperity throughout the world.

For twenty years we have witnessed the increased value of the gold dollar. Day by day and year by year it has been going on, until to-day it commands twice as much of the products of your labor as it did in 1873. Twice as much wood, twice as much wool, twice as much of farms, twice as much of land, twice as much of real estate, twice as much of all the products of labor, twice as much of labor itself. We have legislated for a selfish clique, organized in the greatest money centers throughout the world, controlling public sentiments and public legislation. When you recollect that as against that selfish horde of public conspirators, the money barons of the world, are the men of enterprise and men that will advance civilization throughout the world, just think how the latter outnumber the former. They are as 999 to 1, and they, the 999, are enslaved by the one.

My friends, this thing means human labor. It means that a mortgage shall not he equivalent to a deed. The present system means tbat tbe mortgage is to be transferred into a deed, and that the margin which belongs to the borrower, the man of spirit and the man of enterprise, is to be turned over to the money lenders of the world.

We men of the silver region believe in both metals. We believe that they are both royal metals. We believe that they are the primary money of the world, and we believe that tbeir production should not he restricted. We believe that the mines of this State and of every other State stand above every other industry, whether it he agricultural, commercial or manufacturing. We stand with you of California in what you desire, and we stand ready to aid you. We also ask you to stand by us, with courage to help us in this great work, which means the regeneration of the world and of humanity.

Mr. Voorhies of Amador stated that the secretary had the report of the Committee on Resolutions, which report the secretary read. The resolutions were published as adopted in the PRESS of last week.

MR. SHERWOOD, of Yuba, then made the following remarks: That report provides to endorse the present bill of the Legislature of the State of California appropriating $250,000 to be used when the general Government shall appropriate a like amount. While you endorse that I want to have it incorporated that we, the miners of California, believe that that is correct so far as it goes; but if the general Government does not appropriate $250,000, and they should only appropriate $50,000, we believe that the State of California will appropriate a like amount. That is what we should have incorporated there. Mr. Caminetti fought for the appropriation in the last session of Congress, and I believe it was defeated by some valley crank. I move as an amendment that it be $250,000 or less.

MR. CAMINETTI: I second the motion. I think the gentleman's idea is that if Congress should appropriate only $50,000 to go ahead.

MR. SHERWOOD: That is is.

(*Continued on page 349.*)

Investments in Mines.

The following address was delivered by Senator C. W. Cross before the Miners' Convention:

Mr. Chairman and Gentlemen of the Convention:—I feel considerably embarrassed at being called upon to address you after the distinguished gentlemen who have already so handsomely entertained you. With others who have been co-operating in this movement of the miners to do something for themselves, and watching the cause and trying to help a little here and there where I could, as the rest of you have been and are disposed to do, in hearing these discussions one aspect of the mining situation has presented itself to my mind. It has not yet been discussed before this body.

I lived for many years in the California mining county which from the first has produced the most gold, and have had an opportunity to see something of the advantages and the disadvantages, the assistance and the difficulties, under which the gold miner lives. While the proposition of doing things by legislation, by miners' meetings and by co-operation are of course important and deserve all the attention that they have received, yet, while I have been living for a few years in San Francisco, another aspect of the mining question has presented itself with great force to my mind. If you are inclined to hear me, I will discuss it for a few minutes. It is not the legislative aspect—one which I consider very important and which I have discussed at previous miners' meetings; it is not the fact of our getting together and enthusing each other as miners, but it is purely the business aspect, which our miners are now assuming. I wish that I was more of a business man so I could present this matter from a business man's standpoint. I wish that I was a capitalist so I could understand the views which a capitalist takes of a question of this kind. While all gold miners of California need some legislation, especially with reference to the hydraulic mines and rivers; while we need some legislation to protect the claims which the miners make and to enable them to obtain title—a permanent, recognized title—to these claims, we need a different feeling among the business men and especially among the capitalists of San Francisco and California, with regard to investments in mines, from any feeling which has shown itself in recent years. I am not one of those who share the glory of having been a pioneer; I am not one of those who have helped to make the early history of the State. I have only been a resident of the State some twenty-two years or more, and I have only spent ten years of that time as a resident of a mining county. One reason why gold mining has not attained greater prosperity in the State of California and is not more broadcast as a means of livelihood and is not more made an investment by the capitalist for the purpose of obtaining a profit on his outlay, is a question which ought to be carefully considered. Few men, even among the miners, realize the vast amount of gold that lies hidden in the west slope of the Sierra Nevada mountains. Statistics show that more than a billion and a quarter of gold has been extracted from the gold mines of California, and yet a man who is familiar with the mining regions knows that the vast deposits have only been scratched at the surface and that only a small portion of the surface indications have been followed to determine the value of the deposits beneath and to extract what every experienced miner knows lies in the gold fields of California. If a man should state the probable amount of gold which can be properly mined within the gold fields of California, he would be looked upon as a mere visionary. Those of you who live in the mountain counties and who know of the little excavations that have been made here and there in the gold fields, and who also know that more than a billion and a quarter of gold bullion has resulted from that mining, have some understanding of the vast treasures still remaining.

I lived for many years in Nevada county, and I do not hesitate to say that not one in twenty of the known quartz veins had been worked to a depth of 100 feet; only a very few to the depth of 500 feet; and hardly any, not a half dozen, to the depth of 2000 feet on the dip of the ledge. I believe—and I believe I have good reason for believing—that in the single county of Nevada there is yet more gold that can be profitably mined and extracted from the earth than all the gold that has been taken out in the State of California. And yet that county, with a narrow width, merely crosses a gold belt that extends through eighteen counties and does not include the counties of southern California, which are now beginning to show a considerable production of gold. I believe there is yet to be mined in the State of California twice more gold than all the gold now in circulation in the world. I believe that the geology will sustain the contention. I believe that the experienced local miner in California who will make an estimate of what there is in a given area in his vicinity, and will multiply it by the extent of the gold fields of California, will more than double that estimate.

There are difficulties about gold mining; there are difficulties about obtaining investments that no other business presents, or in the history of the world ever has presented. Those difficulties and those disadvantages are partially the fault of the miners and the residents of the mining counties. Those who are familiar with the business of mining know that a very large share of all of the mining of the State to-day is done by men whom the miners call "prospectors"—men without capital—without capital except that capital which their muscle and their intelligence furnishes. Many of them, when they go out on a prospecting trip, have to go to the nearest store and buy upon credit their pick and shovel, their prospecting outfit and the grub they are to consume while they are to do their prospecting.

I call your attention to another thing, that is that there has hardly been a mining investment in the State of California, which has been made with care, with the business consideration and with the good judgment which men use in making investments in other lines of business. I say there has hardly been such an investment which has not returned handsome profits to the capitalist who has made the investment. Some statistics made public at a recent meeting of the Executive Committee of the Miners' Association show that the average result of one man engaged in the labor of mining in the State of California is nearly four times the average result of each man's labor in the business of agriculture and horticulture in the United States. These figures should be known; they should be appreciated and understood, and availed of by the men who have money in San Francisco and other cities. They show more: they show that the average profit of one dollar legitimately invested in gold mining in California, is on the average more than eighteen times as much as it is on a dollar invested in agricultural pursuits in the United States. These figures should be considered and pondered over and understood by the man who has money that he wishes to invest in a profitable business.

But the mining industry, when you seek an investment in the opening and development of a mine, has great difficulties to overcome, which no other business has. In the State of California, a gold mine is not recognized as a security. You gentlemen who are identified with the business know that. The man who has an acre of wheat-producing land can go to his bank and borrow money on it. The man who has a plant for the manufacture of some of the various articles that are needed by the people of the United States is able to borrow money on his investment, and it is the history of all industries of California, as it is in other countries and in other States, that the man who carries on the business, who has the enterprise and the vigor to go in and inaugurate and carry forward an enterprise, as a rule is not the capitalist, but the man who has to go to the capitalist for money. Before me are many men who have tried to get men with money to put their money into mining enterprises, that were just as good as investments could be, but when they undertook to get that money and went to the capitalist, the capitalist who would loan upon almost anything else in the world would not put up his money to help forward the mining enterprise. This was a good deal the fault of the miners. For some of these things the miners themselves are to blame. For instance, some speculative man who knows how to drink champagne and to dispense it to others, comes into your mining community and picks up a property that the people of that community know is not a good investment, and we, as miners, have not had the courage and honesty in such cases to come forward and say to the proposed investor, "You are putting your money in the wrong place."

What has been the result? When such an investment as that has been made, as illustrated in investments in nearly all of our mining counties, and that investment has failed, it has been heralded to the men of the State, to the business men and capitalists of San Francisco, until they have come to think that the whole business of investment in mines is a dishonest and disreputable business. You owe it to yourselves as miners; you owe it to the business of gold mining; you owe it to the investing class of the State, and you owe it to decency and honesty, when you see such claims being put forward, to stand against them, for one such false move hurts the county in which it is made for years and prevents other legitimate investments from being made. One of the elements in this thing, perhaps the most serious of all, is the conscienceless mining expert, who is the man of all men who has done our gold mining industry more harm than any other kind of man. I am not speaking now of the educated, trained, conscientious mining expert, to whose support every honest miner should come. I am speaking of the man who writes two opinions, one good and the other bad, and he offers to put in the bad one if he is not paid, and the good one if he is.

There is not one of you who has been connected with the mining industry that has not met that kind of expert again and again.

The legitimate gold-mining investments of the State have made, almost without exception, the rich men of the State, where they have been made rich by legitimate means. There are men who will tell you that in this age a man cannot honestly become worth a million dollars. The State of California has men who have, with small beginnings, legitimately become worth a million of dollars each. They made it by legitimate means in the gold industry in the mines of California. The roll of these men would be the longest roll of men who have become rich in the State of California. I can name lots of them over; you know them among yourselves. I ask you to pick out of San Francisco instances in which a capitalist of this State has taken hold of a gold mining proposition, after having given it the same examination, consideration and attention that the proposed manufacturer gives to an investment—a man who has had his proposition intelligently examined and has made an investment after thorough and intelligent examination, with that degree of thoroughness and care and business attention that men engaged in other enterprises use—I ask you to name one man who has made a failure of such investment, and where you can find him. There is not a town in the State of 5000 people that has not a man who has put himself on the comfortable side of Easy street on account of having made a moderate investment in a legitimate gold-mining enterprise. You go to San Jose, to Oakland, to to Los Angeles, to San Bernardino, to San Buenaventura, Sacramento, and you come to San Francisco, and I know in each of these places people who have all the wealth they can properly desire, which has been honestly made out of investments in California and in gold mines. There was a time in California when the moneyed men sought the gold mines as an investment. The best financiers of the State went into it as an investment. Take such men as Ralston, such men as Judson, such men as the Colemans—I could name man after man for a long time who took pains to investigate the mines offered in the market, coming to the best conclusions they could come to, and, acting upon those determinations, put their money into mines, either took the supervision themselves or put in charge men whom they knew were competent to handle such properties, who always came out big winners. Some people talk of them as gamblers, but when they took chances they did not take such chances as they would take in any other known business, because the probabilities of making handsome profits being great in the gold mining business; and they have been greater since gold mining began than they have in any other business or any other place in the whole known world.

Now, our San Francisco community, which is headquarters on money matters, has not given this subject the attention they should have given it. If it is proposed by the Government of the United States to appoint some consul to a little island in the Pacific ocean which has a trade of $100,000 a year, the Chamber of Commerce will meet and pass resolutions to the Government of the United States that they take hold of that matter. But until the Miners' Association sprang up you did not hear that the Chamber of Commerce or anybody in San Francisco undertook as a body to encourage gold mining.

I believe, gentlemen of this convention, that we need in San Francisco something that we have not got. The president and secretary of this Association have tried to organize something of that kind, but have not yet succeeded. There should be in San Francisco some place in the nature of an exchange or headquarters for miners who have a property that they believe to be a good property, to come and leave the representation of that property, and there should be some one whose business it would be to see that these representations were correct, so that any one looking about for a mine would know where to get representations and pointers as to what to do and how to make his investment. Our Mining Bureau has done some good service in this direction, but it was not organized for that purpose. It was more a bureau of public information than a bureau of business enterprise. It was paid by the State and could not properly become a place of business enterprise, but only a place of public information. I believe that in the near future the miners of this State will realize the necessity, the importance and the benefits that would accrue from such undertaking as this. I am not business man enough to know just how it should be organized. But I know some things that should be avoided, because I have seen how badly they have worked.

Now, as to a gold mine ever becoming a basis of security, upon which the owner and gold miner can borrow money to prosecute his enterprise, I am not business man enough to point the way to accomplish that thing, but I am business man enough to know that not one-fifth of the men in this State are employed in the business of gold mining that should be employed in it. I am business man enough to know that there is nothing else that could do the community and business centers of this State so much good as large operations in the gold mining fields of California. We have in California a class of capitalists, and a good many of them of the younger sort, who have inherited their money from their fathers, who made it upon the prosperity of the fathers in gold mining in California in early days, without the faintest idea of ever investing a dollar in claims, although they are hunting for other kinds of investments. It is partially the fault of the miners that they have not made more effort to attract capital to their kind of business. We have had some gentlemen before us today discussing this matter. There is Governor Perkins, who is now U. S. Senator, who has not seen a year since he himself was mining in Butte county, who has not been backing up, in one way or another, gold mining enterprises, and he is backing them to-day. There is Timothy Guy Phelps; he is a man who has backed mining industries in California at one time or another and is backing such industries to-day. I presume that from the manner ex-Congressman Clanie speaks of these matters, that he is one of the men who follows this advice that he has given, and I suppose he has investments. The work in California to-day is carried on by three classes of men: One, the prospector who has no capital; next is the man upon a salary or earning a moderate income, who takes a few shares of stock in some gold mining company organized in the county, and week by week, as he is assessed, pays something into that mining enterprise; there are a few other men like Hayward, and Tevis & Haggin, and the Colemans and that class of men, who have learned the value of that kind of investments, who have an eye open where they can put their money to the best advantage, and they have grown rich on it, but there is another class who never think—and they are the largest class of capitalists—who never think of gold mining as a legitimate investment for some of their accumulations. Those people should be waked up. Such men as Jimmy Coleman, Frank J. Sullivan, and men of this State, who have inherited large fortunes, could make more money by putting a large share of what they have inherited into the gold mines of California by from three to ten times what they can make by building great buildings in San Francisco or by taking Government bonds or taking bank stock. It should be the business of you miners to get the business to them, if you can, in such a way that it will impress them and the business community of San Francisco in some way, as the result of this Miners' Convention, and give them to understand not merely that gold mining is a great industry, but it is to the personal interest and advantage by way of legitimate profits for the business men and capitalists of San Francisco to invest some money in gold mines in order that they may make some more money, make it sure and make it easy.

There is one thing about a gold mining investment that everybody does not know about. If a man manufactures something, he does not know what he is going to get for it; the price fluctuates up and down from overproduction and underproduction—one price one year and another price next year or next month; a man never knows what he is going to get for his product. He has to pay for it as he produces it; when he produces it it goes upon the shelves to be distributed upon credit to the wholesaler, and upon credit by the wholesaler to the jobber, and by the jobber on credit to the retailer, and a large proportion is sold by the retailer on credit. After awhile the money begins to come back. When you are producing you do not know the price you may get. You have to wait for a market to sell on, and when you have sold you have to give credit and you have to wait for your returns, and then you have to take chances of having the sheriff collect them for you. But in gold mining you clean up your sluices for a week's run or a month's run, and you ship the product to the United States Mint. If it is in there before one o'clock, you can come there the next day and get your entire product in twenty-dollar pieces. There is no question as to whether you have a market or not and what price you will get, and no question of credit in return for your product.

These things should be talked about. They should be forced upon people. They should be considered and understood. The man who owns a ship loads it with goods and sends it to Europe and gives credit at the other end of the line for the freight, and so it is with every other line of business. The gold mining business is a cash business. If we can get the people of San Francisco to understand it, for every hole in the ground in the counties now, within two years there will be three good mines in operation, and when the time comes not merely the gold miner of California will be a prosperous man, but it will bring prosperity to every business man who resides in the State. We are here not working for ourselves alone; we are working for all classes of business and people within the borders of our State.

The Successful Application of Electricity to the Operation of Mines.

The following paper was read by Lieut. W. F. C. Hasson at the Miners' Convention:

At the Electrical Congress, held during the World's Fair in Chicago, one of the most prominent engineers of one of the large manufacturing companies, stated that he regarded it the business of consulting engineers to assure the public of the practicability of electrical machinery for the transmission of power long distances.

The independent engineers, recognizing that the perfecting of electric machinery for long distance transmission would only keep pace with the demand for such machinery, have been compelled to rely more or less upon their own intelligence and reputation for honesty in advocating the investment of money in such enterprises.

Heretofore, the data furnished by the electrical companies has been very meagre, and it has been impossible for the engineer to satisfactorily give even preliminary estimates concerning the cost of machinery.

The past year has seen great advance in the standardizing of machines and the publication of sufficient information to enable the intelligent investigation of the feasibility of proposed transmissions.

So much has been written and said about the success and economy of the utilization of water power and the great variety of purposes it may serve when transformed into electricity, that numerous companies have been formed to transmit unlimited power unlimited distances.

Incipient electricians, armed with a few figures, great faith and little understanding, see fame and fortune ahead of them, and talk bravely of the possibilities of cheap power for railways, town lighting manufacturing and mining plants and irrigation machinery.

So powerful is the effect of a small conception of the possibilities of electricity that it apparently induces in the hopeful mind a great and firm belief in itself. Men who have a faint conception of the elementary principles of electricity unhesitatingly state their willingness to undertake the transmission of twenty thousand-horse power one hundred miles, under ground or water, as may be desired.

The variety of statements freely furnished investigators eaves them in an uncertain frame of mind as to whether there is any truth whatsoever in claims made for the various types of machinery.

California has not been particularly happy in its electrical progress. The tendency to accept new and apparently phenomenal projects with the hope of great returns for little outlay, has invariably ended in failure and prevented legitimate progress.

At the present day, the machines for ordinary railway, power or lighting purposes, are so perfected that there is no excuse for even the appearance of failure, or for undue cost for installations.

With regard to machines for the transmission of power long distances for multifarious purposes, there is still much that is vague.

Even the intelligent engineer is frequently perplexed by the conflicting data that he has at hand.

In many manufacturing industries the cost for fuel for

power is so small a percentage of the cost of raw material and labor that cheap power plays but a small part in the cost of the article manufactured.

The successful operation of many mines, however, is entirely dependent on cheap power for pumping, hoisting and milling purposes.

In localities where fuel is cheap, or water power is directly at hand, the commercial value of a mine depends entirely on the quality and quantity of ore.

Electrical plants for mining operation may be divided generally into three classes:

1st. Those for the transmission of power for one or a number of purposes, where the distance does not exceed two or three miles.

2d. Those for transmission of power considerable distances—that is, from five miles upwards, to be used for operating continuous and uniform loads, none of which is less than 30 H. P.

3d. Those for transmission of power considerable distances, to be used for a variety of purposes, such as mills, hoists, pumps, lights, etc.,—that is both uniform and varying loads.

The first class is easily provided for by the use of direct current apparatus, and in cases where there have been failures, the cause will invariably be found to be due to ignorant or careless engineering work.

The second class may be solved in most instances by the use of single phase alternating current apparatus, with or without the use of transformers depending on the distance.

The economic point at which it is advisable to use transformers in order to transmit at a higher pressure than may be safely generated in the machine may be easily determined.

Although there was considerable difficulty in getting into successful working order the only plants of this nature in operation in California at present, it was due entirely to the failure on the part of the engineers of the electrical manufacturing company to intelligently investigate the circumstances under which the machinery was to operate.

These obstacles have now been entirely overcome, and machinery of this type, properly installed, can be guaranteed to operate safely and continuously.

The third class requires, at the present stage of electrical science, the use of multiphase apparatus, and will in almost all cases, require transformers, in order that the cost for copper for the transmission line may be kept within reasonable limits.

The plans for such an installation require the most intelligent engineering thought, and a plant installed at haphazard, with the idea that it will furnish power for the operation of hoists and other intermittent loads, and at the same time operate mill machinery at a uniform speed and give a satisfactory lighting service will, in almost every case, prove to be a failure.

There are several companies in the United States that are prepared to manufacture the necessary machinery to meet any of the above circumstances, and further prepared to guarantee its successful operation.

It must be borne in mind, however, that a guarantee, however responsible the contractor may be, really means but little. Although the payment for machinery may be made dependent upon the fulfillment of the guarantee, this by no means compensates the purchaser for the money lost by delay and the consequent trouble and worry.

The only real safeguard is the selection of such machinery as is known to be successful, and to take every precaution that its selection and installation is placed in the hands of capable people, whose only interests is in the successful operation of the machinery and not in the profits accruing from its sale.

The vital question is the comparative cost of operation of the mine by electrical machinery and by steam or water power. In that connection there is presented for your consideration the absolute cost of electrical machinery and its operation, and the cost of the engine and boiler plant and its operation, to produce the equal results at the Standard Consolidated Mine at Bodie.

Mr. T. H. Leggett, the president of the mine, is one of the most progressive mining engineers in the State, and had the courage to install the first alternating current plant for long-distance transmission for power purposes only in California.

At the time the machinery was contracted for there was but little absolute assurance of its successful operation. That the electrical difficulties incident to the locality were little understood by the engineers of the contracting electrical company is evidenced by the fact that it required the greater portion of a year to get the machinery in successful operation.

The intelligent manner in which Mr. Leggett overcame the many unforseen difficulties that presented themselves reflects great credit upon him, and a knowledge of the results he has obtained is of great importance in the consideration of power transmission plants. The figures in this case are as follows:

Expense for electrical machines, water wheels, wire and pole line material, freight, and all construction and installation for a plant to develop 150 H. P. at the mill	$26,000
Total expense, including pipe line and power house and other buildings necessary	37,000
Estimated cost of engines, boilers, freight, construction, buildings, etc., for a high-grade steam plant to develop equal power	13,000

This leaves a balance in favor of steam machinery of $24,000 on first cost.

The expense for fuel for production of power for the year ending February, 1893, was	$22,700

This expense is completely wiped out by the use of electric machinery operated by water power.

Allowing $700 per annum for heating purposes, the annual saving in fuel becomes	$22,000
Assuming a period of operation extending over ten years, the amount expended in fuel at six per cent compound interest becomes	307,000
Against this must be charged the original expense and compound interest on the extra cost of electric plant over that of steam plant amounting to	43,000
The balance in favor of the electric plant is	264,000
The wisdom of the adoption of electric power in this instance is emphasized by the fact that the average annual dividends for the two years ending February, 1894, was	28,500

All circumstances remaining the same, the saving in fuel will practically double the dividends.

The cost of attendance for electric plant will be slightly in excess of that for steam plant, but the cost for maintenance and charge for deterioration should be less.

The Standard Consolidated Mining Company is now making arrangements to install an electric plant for the operation of hoists and mine machinery. This plant will effect an additional annual saving of $11,000 heretofore expended for fuel.

It is absolutely impossible to make a general statement that will be approximately correct as to the relative economy to be gained by the use of steam or electric power in all localities.

The variable items are: Distance to available water power; cost of development of water power; character of country through which pole line is to pass; local price for fuel and rates for labor; cost of transportation of freight to mine.

Eliminating certain of these points, and assuming other conditions to be equal to those at Bodie, which is a fairly remote point, an estimate has been made concerning the installation and operation of machinery for a forty-stamp gold quartz mine and mill under the following conditions:

Distance to available water power	20 miles
Capacity of generating plant	300 horse power
Type of machinery	Multiphase, alternating current
Transmission voltage	10,000 volts
Maximum loss in transmission	10 per cent

Demands for power: 90 H. P. for stamps, crushers and concentrators; 75 H. P. for hoist; 50 H. P. for pumps; 15 H. P. for electric lights.

Annual operation, 350 days of twenty-four hours each; estimated period of operation, ten years.

The cost of necessary electric and hydraulic machinery and wire for transmission, all f. o. b. San Francisco, together with expense for material and construction of pole line and stringing wires, should not exceed	$ 36,000
The cost of engines and boilers to produce equal results, with the exception of the electric lights, all f. o. b. San Francisco, would not be less than	10,000
Assuming cost of transportation and installation of the two classes of machinery to be practically the same, the difference in the first cost in favor of steam machinery becomes	26,000
This regarded as a ten years' investment at 6% compound interest represents	46,500
The annual difference in expense for fuel, operation, maintenance, insurance, taxes, etc., in favor of the electric and hydraulic plant will not be less than	40,000
Regarded as an annual investment at 6% compound interest, this in ten years amounts to	558,500
The total difference in favor of the electric plant thus becomes	512,000

From this, of course, must be deducted the accumulated value of the investment necessary for the development of the water power.

These estimates are not to be taken literally, but they truly represent the great margin there is in favor of the electric transmission of power, when the matter is considered on a business basis.

These results being true, and in one case they have been actually established, the question naturally arises as to why there should be any hesitation in the investment of money in power transmission enterprises, and why so little advantage has been taken of the possibilities that exist in that direction on the Pacific coast.

To this there are many answers:

1. The electrical manufacturing companies exploited the field and claimed to be prepared to meet the demands for mining machinery before such machinery had even been designed. Finding that a demand existed, machines were designed to meet ideal conditions. It is by no means surprising that when installed as ignorantly as they had been designed, many unforeseen obstacles prevented the successful operation of these machines. However, it was from a study of these difficulties, and the devising of methods for overcoming them, that perfected systems have finally been obtained.

Further, being themselves ignorant of the probable cost of machines the preliminary estimates were in many cases made so high as to prohibit their use. This is evidenced by the fact that at frequent intervals during the past two years estimates have been made for the cost of machinery to transmit 1000-horse power in Nevada county, and the present estimate is one-fourth of the original one.

2. There is a definite lack of confidence on the part of the mine owners as to the successful operation of electrical machinery, owing in part to the failures that have occurred, due to the causes stated, and in part to the fact that electricity is regarded as a very mysterious element.

The manufacturing of electrical machinery is no longer any more of a mystery than that of building engines and boilers.

One great error on the part of those investigating the feasibility of employing electric machinery has been that of relying on the manufacturing companies to freely do their preliminary engineering work.

Although the electrical manufacturing companies have been liberal in pioneer engineering work, their province is to make and sell machinery. If they are also called upon to do free engineering work in all parts of the world, and still make a profit on their machines, the prices of necessity must be made high accordingly.

It must be self-evident that in relying on the manufacturing company for engineering advice, the purchaser eliminates the possibility of that competition which he should desire. Further, an agent whose salary is dependent on commissions on sales should hardly be placed in the position of giving disinterested advice as to the practicability of any proposed enterprise.

3. In the conducting of any enterprise dependent on cheap power for its success, it would appear essential to retain control of the production of that power.

In the development of new industries in California, the tendency is always to look to foreign capital. If the venture fails, the foreign capitalist has a grievance that he ventilates and prevents investment in legitimate enterprises. If the venture succeeds, the chances are in favor of its becoming a monopoly, and the original enterprise is at its mercy.

In cases where there are groups of mines dependent on cheap power that requires capital only for its development, it is certainly advisable for the mine owners to strain every resource, in order to retain control of the power company.

In brief, of this you may rest assured:

Electric machinery, guaranteed to efficiently transmit power for multifarious purposes, can be purchased at moderate prices.

Carefully selected, properly installed, and controlled by companies governed by a financial policy that reaches beyond the moment, it can be made to play an important part in the development of the industries of the Pacific coast. You may accept it as an axiom that no electric transmission of power is absolutely impossible, considered as an engineering problem, although it may be thoroughly impracticable from a commercial standpoint.

With the revival of hydraulic mining and the economic methods now offered for the operation of mines requiring extensive power, it would appear that the mining industries of the Pacific coast, instead of being on the wane, are on the eve of a period of assured success; and the men who have devoted their time, money and energy to the maintenance of these industries during the time of depression are to be congratulated on the bright future in view.

The Hydraulic Gravel Elevator System in Hydraulic Mining.

The following paper was read before the Miners' Convention by R. H. Campbell of Siskiyou County:

I have deemed it proper to prepare for presentation to this convention, held under the auspicies of the California Miners' Association, a brief resume of the general conditions in which hydraulic mining has been conducted in this State and elsewhere, by means of the system of hydraulic gravel elevating through the use of hydraulic gravel elevators.

Although the system was introduced into use in this State say ten or more years ago, in certain mining districts, yet comparatively little seems to be known or understood by the mining fraternity of the scope of its practical operation, and having given the theory and practice of this system considerable attention in my own mining enterprises, and having acheived very satisfactory results, I beleive it to be due to my fellow miners, and to those who may contemplate becoming interested in hydraulic mining, to relate something of my practical experience in this line of industry.

All gravel miners are aware that there are certain peremptory conditions governing the successful operation of the ordinary hydraulic and sluicing system of mining.

First: A sufficient volume of water acting under a given pressure. Second: An outlet having a sufficient grade or descent to permit the washed material or debris to be carried away and disposed of by the natural force of the water to such place of deposit as will not interfere with further washing of the bank.

Water is indispensable, for without it sluicing cannot be accomplished.

It has always been held that where grade was lacking to carry away the debris, except it was hoisted by derricks or man power, that the deposit could not be profitably worked; but the adoption and use of hydraulic gravel elevators has obviated this latter difficulty and made it possible to wash and elevate the gravel at the same time, by the same water, and as rapidly as by the ordinary method of sluicing.

All miners appreciate good dump (to put it in the usual vocabulary of the miner). They like to send the debris over some steep cliff or down some deep canyon where it would not molest them again,—this is what the Pike county miners of our early days called "drap." They like good "drap."

A good story is told of one of those early day miners who had been troubled with a bad dump. He found a deposit of gravel where water was handy and a canyon hundreds of feet deep to dump into. He could not resist the temptation so he started to work sluicing. He did not stop to see whether there was any gold in the gravel or not but worked away enjoying his excellent dump, when a prospector came along and stopped to see his claim; it worked nicely and he supposed the man was making good pay, so he asked him how it was paying. "Pay? why, this never paid anything." "Why are you working it then?" "Why, because I have got such a good dump."

Auriferous gravel or placer deposits are found ranging from ten to sixty feet in depth, and in many districts of a greater depth, but in very many instances the natural slope or grade of the outlying ground is too slight to permit of the working of the deposits by piping or sluicing, and this frequently occurs in creek and river bars or beds when the gravel is known to be rich in gold.

It is in these places and under these natural conditions that the use of hydraulic gravel elevators will be found advantageous and, as a mater of fact, imperatively necessary for the proper and successful working of such deposits.

These conditions, so frequent in their occurence, brought a very crude system of elevating into use.

The first gravel elevator I saw in operation was an open sluice box placed at an upraise angle of about forty degrees, with an hydraulic nozzle placed at its bottom or entrance. This kept the pit comparatively dry and elevated all of the gravel sluiced to the box; it worked passably well except when the pit would be flooded and in that event the discharge from the nozzle would be smothered or drowned and consequently could not throw anything out of the pit. Then a suction of pipe was laid in the box and the stream from the nozzle diverted into it which would free the pit in a very short time when the suction of pipe would be removed and the elevating of the gravel he resumed.

This eventuated in making use of a closed pipe tube or upcast and several letters patent were obtained, many of which were faulty in device and construction and even now at this date the best are susceptible of certain improvements.

In the early experiments the upraise pipe was placed at an angle of from thirty to forty-five degrees, but it has since been found better to place it in a perpendicular position and apply the water or direct the nozzle at such an angle that air is admitted, and the capacity of elevation is such as to astonish the most experienced miners.

At Quartz Valley, in Siskiyou Co., where I have been carrying on hydraulic mining for fourteen years, I found much of my ground, and by far the best of it, too deep for working without the use of the elevator. I at once visited every elevator in the State that I could hear of; the result was that I contracted for an elevator of the Martin pattern, put it in and ran it with good success for five seasons. The quantity of water used through the elevator was 1000 inches under 248 foot pressure, using a six-inch nozzle with a fifteen-inch throat and a twenty inch upcast pipe. With this we elevated the material from two and sometimes three giants, using three and four-inch nozzles and 800 inches of water. The upper or discharge sluice was six feet in width with three per cent grade, fortified with 100 inches of extra water, making nearly 3000 inches in the main discharge sluice, and then we often had to wait on it to do its part.

The elevator carried everything through it in an instant of time, provided that no large boulders obstructed the entrance or throat section, and performed its allotted work continuously and never required rest, and, as one of my men facetiously remarked, "It gulped up everything that came to its maw and hollered for more."

Had the upper discharge flume been given greater capacity and the facilities for piping the gravel to the elevator entrance been proportionately increased, I hesitate to state what would have been its capacity, for it would appear incredible.

In this connection I deem it advisable to state that there is but one occurrence which can effect the capacity of the elevator in its operation of elevating gravel or other material, and this can only be occasioned by a superabundance of water through and from the giants used in piping, for it has been found that a superabundance of water will overload the elevator and its action become inert, whilst singular as the fact may seem under proper conditions of volume and pressure of water no overloading of gravel can occur. Touching upon the matter of wear and tear, much depends upon the nature and character of the material piped to the elevator. If it consists of heavy wash intermixed with heavy boulders, as in river bars, the wear will naturally be greater than if of hill or mountain clay, dirt and rock. As an indication of the amount of wear sustained during my operations at Quartz Valley, covering a period of five consecutive seasons, I deem it proper to state that the builders of the elevator furnished an extra set of chilled iron liners, which, however, were never used, the first set being only half worn at the end of the last season. There was considerable rock mixed with the deposit, but after being broken or sledged it was passed through the elevator.

The cost of repairs during this entire period was surprisingly inconsiderable, and I can safely state did not amount to $50 in that time. There were no stoppages incident to the operation of the elevator except occasioned by the washing down of a boulder too large to pass its throat section, which occasionally occurred, and I have a vivid remembrance that upon one occasion the gates were not touched nor the water shut off either night or day for a period of five weeks.

There is a prevalent idea that the adoption and use of these hydraulic gravel elevators may prove an expensive experiment. My experience, as related above, distinctly proves the contrary. The original cost of the necessary plant is inconsiderable, in view of the advantages to be gained; the cost of maintenance and attendance is but little more than the usual expenses incurred in the ordinary methods of hydraulic mining, and I am firmly of the opinion that where the proper conditions of a sufficient volume of water and an adequate pressure are available, that these elevators can and will be largely utilized in mining shallow places and operating in mining districts where the adjacent surface ground has too little fall or grade to carry away naturally the washed debris, and that they can also be advantageously utilized in elevating and impounding debris in the old and washed pits left in our early mining operations, where the tailings can be retained forever without detriment to the interests of the "honest grangers."

An Electrical Process for Saving Gold.

The following is from the Butte *Inter Mountain:*

Two young chemists of this city have applied for a patent on a device which practical metallurgists believe will revolutionize many of the methods now employed in the treatment of gold ore especially. That there is merit in the device is evidenced by the fact that the general manager of one of the largest smelters in Butte has purchased an interest in the appliance, and before long it is expected that a machine capable of treating a large amount of ore daily will be in active operation in Butte. The machine is known as Clark's Electric Chlorinator, and it is claimed to be a great improvement upon Theis' process of chloridizing gold ores. It was constructed and tested at the Western Iron Works during the past summer.

The apparatus consists of a cylinder sixteen feet long by two feet in diameter, made of staves two and a half inches thick and firmly bound at intervals along its length by iron bands. The cylinder is so constructed that the upper half can be removed when necessary to repair the interior. Passing through this cylinder is a wooden octagon shaft, provided with stuffing boxes and bearings at each end. Into this shaft is mortised a series of pins a spiral line its entire length. The pins perform the office of agitators, and also convey the ore pulp in the cylinder to be chloridized. In the interior of the cylinder, upon the bottom, extending its length, is a carbon plate, to which is connected the positive wire from the dynamo. Attached to both sides of the cylinder, upon the lower half, are boxes. The bottom of the boxes are four inches above and on a line with the carbon plates in the interior of the cylinder, which acts as anodes. About two inches above the bottom of the boxes a series of holes or slots are cut through the cylinder, in which a diaphram of any suitable material is placed to keep the pulp from passing into the boxes, but sufficiently porous to allow the current to pass with as little resistance as possible. In the bottom of the boxes is placed a bath of mercury about one inch deep, to act as the cathode, and connected by immersing a piece of copper plate, to which is attached the negative wire. The above is a description of but one section, of which all others in the series are similar. They are arranged on an inclined plane so that the ore after traveling the entire length of the upper cylinder discharges into the next one beneath, and after passing through it is discharged into the next, and so on until the capacity of the mill is attained, say twenty tons of twelve hours' retention for each ton. The pulp is then discharged into filtering tubs and filtered and washed and the gold precipitated by protosulphate of iron or sulphurous and sulphuretted hydrogen gases.

The electrical process of the apparatus is conducted as follows:

It is a well known fact that if a current of electricity is passed through a solution of salt (sodium chloride) the chlorine and oxygen comes off at the positive poles, while the sodium and hydrogen is liberated at the negative electrode. The apparatus is so constructed that the chlorine comes off in the cylinder under the ore is a nascent state, attracting any free coarse gold which settles upon the carbons by the agitation of the ores, while the excess of free chlorine dissolves the fine gold suspended in the body of the ore. The hydrogen and sodium hydrate comes off in the boxes outside of the cylinder and away from the ore, and is prevented to a very large extent from combining with the free chlorine in the cylinder by the porous diaphragm between the boxes and cylinders.

By the above construction the chlorine which is liberated in the cylinder in the ore remains in a comparatively free state and continues to accumulate and act upon the gold in the ore. The current of electricity decomposes part of the chloride of gold formed, and deposits it upon the mercury in the outside boxes, where it forms an amalgam, which is easily obtained, while the gold that remains in solution passes with the pulp through the last section and into the filtering tanks, where it is obtained as previously stated. The apparatus has been tested alongside of the barrel chlorinator with the same charge and under similar conditions, and in every instance gave higher saving than "Theis' Process" did. While it has never been tested upon a large practical scale, it gives evidence of being practical in every particular and be much cheaper.

Platinum.

"If platinum continues to advance gold will soon be no longer distinguishable as "the precious metal," said Xavier Detarge, of New York. "If it continues to advance at the rate it has in the past three years gold will be as cheap in comparison as silver is to gold. We have heard of Black Friday, and the fortunes made in cornering gold; we read every day of the corners made in corn, pork, wheat and other commodities, but if a man could have foreseen the advance and made a corner in a platinum he could have made a barrel of money. Since 1891 the price of platinum has increased five-fold and is still climbing. The cause of this tremendous advance is the demand for electrical purposes. Platinum has always been a scarce metal, hence the appreciation in price, for the output of the mines has not kept up with the demand. As electricity is applied more and more each year, the numberless uses, the demand and the price will increase, as no other metal so far as discovered will serve the electrician's purpose half so well, if at all."

Western Lead Smelting.

Western lead-smelting works receive for treatment almost every known ore of the precious metals, with the exception of low-grade gold quartz, says the Colorado *Mining Review*. A very common type of ore treated by them consists of mixed sulphides—galena, blende, pyrite, marcasite, arsenopyrite, stibnite, etc.,—which, when present in large quantities, are roasted before smelting, but also enter raw into the furnace charge in smaller amounts. Metallurgists with the conditions prevailing in the far west are sometimes exercised over the loss of a number of possible by-products in the usual system of reduction, and especially on account of the zinc. It is said, for instance, that the smelters are saving lead, and giving their main attention to that while letting zinc, which has a higher market value per unit, go to waste. This is quite true of the usual system, though the "bag" process arrests part of the zinc oxide and other volatile products, and the ordinary flues catch other portions, which however are utilized very imperfectly. Now the facts are these: There are very few lead mines in the far west which could be operated at a profit for the sake of the market value of the lead, as lead. There is always a demand at the smelters for heavy lead ores, of which the Cœur d'Alene mines and a few others produce large quantities, but this demand again is not for the lead as such, that is, to turn out lead for the market, but because it is the basis of the whole smelting industry in which lead is used as a collector of the precious metals. Besides this, the lead of the far west always carries more or less silver and a little gold. Although called lead-smelting, and rightly so from the technical standpoint, it is really, and from the commercial point of view, a process for the extraction of silver and gold in which lead is used as the collector of these metals. The lead itself is a by-product. It has a market value, of course, and, after being turned into base bullion and subsequently refined, the proceeds form a large item of income. On its own account, however, very little lead would be produced west of the Joplin district of Missouri and Kansas. The base bullion, requiring not merely a softening operation but a true refining process yields small quantities of other by-products, of which little account is made. As to zinc, so far from yielding a valuable by-products, it is regarded as a positive detriment in the lead-smelting process, and ores containing it are subject to deductions in price. The blende is also badly mixed with other volatile minerals, so that a distillation process would give an impure zinc. When the western country becomes more thickly settled, so that there is a larger local demand, and the long hauls to market are unnecessary, it is probable that the whole system of ore reduction may be changed, and brought into smelting like that of Germany, where practically everything of value is worried out of the ore by an elaborate system of concentration and classification, followed by special processes for the different classes of material. Under existing circumstances this would be impracticable, as would be also any general wet process, with electrolysis. The enormous cost for additional plant, the relatively high wages, the cost of transportation of ores from mines to work and of products from works to markets, stand in the way. While it would be desirable to utilize all the numerous accessory metals and substances—zinc, antimony, arsenic, sulphur, and many others in less amount—present in the mixed ores, in must be remembered that the lead-smelting industry of the west has been developed to a very high degree of efficiency, regarded in connection with peculiar conditions; and that even under obvious disadvantages it now leads the metallurgical practice of the world in its own sphere. To have brought the cost of smelting to within $4 per ton of neutral ore—fuel, flux, etc., has to be transported greater or less distances, and where labor is by no means cheap—is certainly a great achievement; and to do this with a technical success measured by a recovery of 95 per cent of the silver and lead, and more of the gold, is a still greater achievement. Those who find fault with present western methods do not realize either the intricacy of the conditions or the remarkable progress that has been made.

THE knowledge that nearly all clay contains aluminum, and that aluminum is every day becoming of greater importance from an industrial standpoint, tempts one to look with greedy eyes upon each clay bank he passes and make mental estimates of the wealth waiting to be shoveled out. The difficulty of obtaining the metal from clay, however, renders it prohibitive. Its chief source is bauxite, a mineral occurring in quantity in Arkansas and the southern Appalachian valley; but the continuity of the vein has not been determined.

Working Placers With Water Scarce.

A letter from Cerrillos, N. M., to the Denver *Mining Record* says:

Mr. H. H. Armstead of New York, president of the Gold Separator and Sluicing Company, has leased from the Irrigation and Hydraulic Mining Company, which has located and since 1885 held possession of 10,000 acres of mineral land in the Golden district, eighteen miles south of Cerrillos, several hundred acres of placers, and has on the ground and in course of erection a Brewster battery capable of handling 100 yards of dirt per day. The complete machine will handle 500 yards a day, but this part of it will be in operation by the 20th instant and a thorough test made. This machine was invented by Brewster of New York and is covered by sixteen patents. The one to be tried here is the fourth one ever set up complete with dirt cars, track, etc. The cost of the plant will approximate $50,000 and will give employment to several hundred men, mostly unskilled laborers. This is not a dry washer, but very little water is necessary. The dirt with which the test will be made is to be taken from 100 prospect holes dug at haphazard, but not less than 500 feet apart, a yard of earth being taken from each one. A sample will be taken from each lot and panned, and by comparison give an exact knowledge of what the machine will do.

For a long time every sort and condition of men have racked their brains to invent some sort of a machine of large capacity, either a dry washer or one which will require very little water, that can be used profitably in handling the dirt in the rich placer ground of the Golden and Dolores districts of New Mexico. Many have been tried and an enormous amount of money has been expended in the efforts, and whether it is the Brewster battery or some future invention which is to do the work, a gigantic fortune awaits the man who shall be lucky enough to succeed.

These districts have been worked for hundreds of years in a crude way by Indians, Spaniards, Mexicans and whites, and even now there are probably 650 men making a living there with small dry washers run by hand and for the most part working over the old dumps. These placer grounds extend over a large area, and though millions in gold have been taken out there are yet untold millions more awaiting the hand of man.

New Tin Plate Company.

The Indiana Tin Plate Manufacturing Company of Atlanta, Ind., were organized last week, and the following officers elected; C. A. Fore, president; F. D. Morgan, vice-president and general manager; Dan Goodykoonty, treasurer; E. S. Walton, secretary and assistant treasurer. The company were chartered under the name of the Atlanta Steel & Tin Company. Capital authorized $150,000. This company were originally incorporated in October, 1892, an eight stack-wash house was built and in the spring of 1893 the company commenced tinning, but owing to an impossibility to reconcile existing differences between the manager and the company a receiver was appointed, and the plant was recently sold for the benefit of the creditors. It is the intention of the new management to put in three stands of hot and three stands of cold rolls, ample capital having been raised for that purpose, the contracts for the engines, boilers, mill building, pickler, doublers and other machinery having already been let. This company will have the advantage of free natural gas for fuel, and will own 2,000 acres of gas territory southwest of Ellwood, Ind., being the very best gas territory in the Indiana gas belt. The mill will be arranged on the plan of the New Castle, Pa., plant; the mill building will be 80x280 feet; the wash or tin house, 50x100; pickling room, 30x80, and the assorting and packing room, 50x80. All brick and iron work will be commenced at once.—Chicago Journal of Commerce.

A Restraining Dam.

In an interview with Senator T. L. Ford, that gentleman informs the Nevada *Herald* that he recently had a talk with Lieutenant C. E. Gillette, of the Debris Commission, about dams. The Lieutenant is of the opinion that $500,000, or less, would build a dam at the Narrows that would last for all time and be large enough to hold all the debris for many years to come. He states that a dam could safely be built 250 feet high at that point, and with such a dam every mine on the Yuba river and all of its branches could turn the monitors loose as they used to, yet without the slightest injury to any navigable waters.

The Narrows is the most favorable spot of any for a retraining dam. It is a deep and narrow gorge, widening upstream and forming a great basin that would hold an immense amount of debris.

Now if the appropriations sought at the last session of the Legislature could be secured—if Congress could be induced to appropriate the $250,000 necessary to make the State's appropriation available—there is no reason why that dam should not be built.

Scientific Progress.

A Handy and Efficient Storage Battery.

The importance of the storage battery in future electrical work is beeoming daily more apparent. While in England and ou the European eontinent it is exteusively and successfully used, in America it has met with indifferent sueeess. The trouble here seems to be that storage batteries are worked with too small a margin of safety; we want to get too mueh out of them. As W. W. Criseom recently put it: "A storage battery continually worked to its commercial rating is a commercial failure. A storage battery worked sufficiently within its capacity is invariably a commercial success." A battery is now made that, while thirty per eent lighter than other batteries of corresponding capaeity, eau be worked well within its capacity, and still give most satisfactory service. It is of usual streugth and solidity, and will stand any amount of hard usage. The lead plates are so assembled as to expose a very large amount of active service to the action of the electrolyte. The battery can be rapidly, ecouomically and efficiently charged. It may be both overcharged and diseharged rapidly without detriment to the plates. In proof of this it is mentioned that a plant of these eells has been diseharged repeatedly, for the last sixteen months, at rates from one and a half to four amperes per pound of plate, and uot a siugle plate of the batteries submitted to those severe tests was "buckled," or warped. The "buckling," or bending of the plates after a period of wear, has always been a fatal defect of the storage battery, and this reeord is of value in showing a distiuct stride iu its eonstruction. The new battery is well suited to the runniug of eleetric launches, lighting, or any service where a high diseharge rate may be occasionally demanded, and it is claimed to be espeeially adapted for traction work.

Boiler Corrosion.

Corrosion in boilers has long been an annoyanee to steam users, and anything that will serve to prevent the immeuse loss following the condensation of so many short-lived boilers, to say nothing of the loss in efficiency of those eontinued iu service, and the danger that always aecompanies the use of a boiler thus affected is sure to meet with the approval of the progressive engineer and his employer.

The efficiency of zine suspended in water in preventing corrosion iu boilers is due to the fact that when two metals of a dissimilar character are immersed in a liquid capable of chemically acting on both of them, and are eonnected or in metallie eontact, the metal which is most affected or aeted on by excited medium becomes the positive or corroded element, and the other becomes the negative or inaetive element, thus escapiug corrosion as long as the metals are in contact. Zine being the most readily acted on, it becomes the corroded element, and concentrates and absorbs corrosion, which would attack the metal of the boiler if the zine were not present in metallic coutact; thus a very small quantity of zinc suspended in the water, or about two pounds weight of zinc per tou weight of the boiler, will prevent corrosion. When the water is good, or moderately pure, an enamel-like film or coating, efficiently protective against corrosion, may be given to the interior surfaces of a boiler, when clean, by using zine plates suspended in the water and adding common soda continuously to the feed water.

Another method used in the application of zine for this purpose is that of plaeing a ball of zinc, through which a bar of pure copper is passed, in a eage suspended in the water, and with this arrangement to connect the ball by wire to those parts of the boiler which suffer most from eorrosion.—Manufactures' Gazette.

CARBONUNDUM, the new abrasive and polishing material, bids fair to entirely supersede emery, eorundum, and even bort, the best and hardest snbstanee of this elass hitherto known. It is made of finely powdered eoke, common table salt and sand thoroughly mixed and subjected to the heat of an eleetrie furnaee for about fourteen hours. The eystals thus formed are washed, molded into the desired shape (usually that of wheels) and theu fired from four to six days. When the inventor came to New York in 1891, he carried all the earbonundum in the world with him in a two ounce bottle. The product in 1893 was 15,200 pounds. The inventor has reeently disposed of his Europeau patent rights for a very large sum, and retains his interest in the Amerieau eompany.

LORD KELVIN is of the opinion that the internal heat of the earth has no bearing whatever upon climates, contending that the intense heat known to have onee existed at the surfaee of the earth was due to a much higher temperature of the sun. The earth might be of the temperature of white hot iron 2,000 feet below the surfaee, or as eold as ice fifty feet below, without altering the preseut elimate in the least.

FROM the results of about ten thousand observatious taken simultaneously in Russia, Germany and Pennsylvania to determine the supposed oscillatiou of the earth's axis of rotation, it has been shown that the north pole moves in a spiral line from west to east. The motion is at present decreasing and is very small in auy case—probably not more than forty feet.

PROF. JOHN MILNE, the earthquake expert, who is eonnected with the Imperial University of Japan, states positively that the prevailing belief in a relation between earthquakes and magnetic disturbances is wholly unfouuded. His exhaustive investigations of the subject have proved that the one is not iu any way dependent upon the other.

NOT eonteut with the pneumatic tire, we have gone further and fared worse. An entirely pneumatic wheel has made its appearanee. It is a flattened ball of rubber with a tough outer eovering. Two metal plates hold the side of the wheel flat and are kept in plaee by a tube through whieh the axle passes.

THE heat developed by the firing of heavy guns is remarkable. Duriug some receut tests at Sandy Hook a gun that had been fired seveuty-five times melted solder placed upou the chase, while another was hot enough to soften lead, indieating a temperature of 600 degrees Fahrenheit.

Save the Minerals.

Quite a number of miners who are interested in mining property have called on us to see if their land is ineluded in the odd sections claimed by the railroad. This filing of the railroad compauy is for all unpatented lands in odd sections, and in this is ineluded the Dry Digging country east of town. As that is all mineral land, a protest will immediately be filed. If land is more valuable for minerals than for agricultural purposes, it should be saved from the clutches of the railroad for the prospectors and miners of this eounty. This affects a large portion of the land aloug Coyote creek, Grave ereek, Louse creek and all along Jump-off-Joe. Any oue who has unpatented mining property in odd sections who will write to us or call at this office giving the deseription of portions of the section in which they are located, we will look the matter up for them. This is a matter that should not be delayed, as the 6th of December is the day the chance of protest will close.—Grant's Pass Observer.

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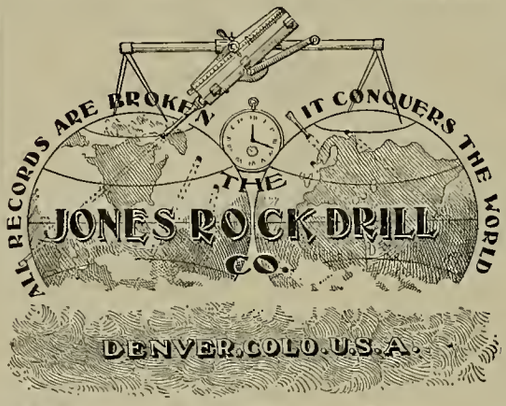

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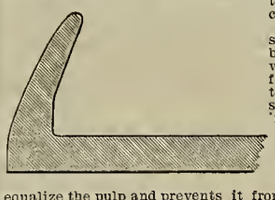

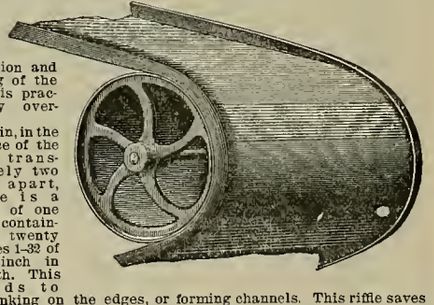

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Mechanical Progress.

Steam vs. Gas Engines.

In a paper recently read before the English Institution of Gas Engineers, Mr. Bryan Donkin, so well known for his work in connection with steam, gas and oil engines, has drawn an interesting comparison of the results to be expected from engines of these types.

The notoriously inefficient small steam plants up to, say, fifty-horse power, operating under conditions that exist in so many places in this country to-day, and presumably in England as well, if the Manchester tests are any criterion, and barley touched upon, and not at all from a practical standpoint. This, writes W. H. Cothren, in *Electrical Engineering*, is the most promising field for internal combustion engines to-day. And in this country especially, oil engines, even of large size, should become important factors in power production, owing to the ease and cheapness with which the various refined products of petroleum may be obtained even in the remotest hamlet.

At present gas engines are made in England in sizes ranging from one-fourth to 600-indicated horse power, and there is a marked increase both in sizes and numbers sold. Some 7,000-horse power are there used for electric lighting alone, and it is estimated by the Messrs. Crossley, whose works last year turned out 2000 engines, that there are at least 20,000 employing the Otto cycle in use, and is presumable that there are as many more other varieties.

The use of ordinary lighting gas is customary in sizes up to ten-horse power, but for larger sizes a small, convenient apparatus has been devised for the prodution of a gas that cannot be used for illuminating purposes, but which gives very economical results when burned in an engine cylinder. This gas is most frequently called Dowson or generator gas, from the man who has done most to bring it into prominence. The best fuels for producing it are anthracite coal and gas coke, as they yield no tar. The thermal efficiency is low, it having about 160 heat units per cubic foot, as compared to 615 to 630 of London lighting gas, consequently about four times the quantity is required to produce the same amount of power. The great quantity obtained, however, together with the small amount of depreciation and labor required for production, make it in many cases comparable in cost to gas at twenty cents per thousand.

Gas engines labor under the disadvantage that they cannot be started under full load requiring the use of friction clutches, and in most cases they have but one impulse to each four movements of the piston, necessitating greater weight per horse power than with steam. On the other hand, the gas engines can be started instantly, and there is no danger from fire or standby losses when it is shut down. Neither is an attendant required to keep the boiler in operation. The disadvantages attendant upon the fewer impulses per minute are more theoretical than real, for the regulation of good engines is now sufficiently close for all practical purposes.

Improvement in Casting Metal.

Not only machinists, but all who have occasion to use machinery, will recognize the merit of a joint invention of residents of Fair Haven, Vt. It is designed to produce such a smooth surface on metal castings, both outside and in bores, as to render it unnecessary to use either tools with or without a lathe, before devoting them to the services for which they were made. It is especially applicable to the casting of such articles as pulleys and gear-wheels, but is susceptible of a more general use. Its object is not only to give a good finish without tool-working, but also to prevent the adhesion of the casting to the core or mould, and incidentally to modify the usual effect of the chill produced by metal cores and moulds.

The inventors, in the employment of their improved method, prefer metal cases or moulds; but to produce the best results, these appliances should have as smooth a surface as is attainable, as this, before molten metal is poured in, should be covered with a thin coat of asphalt, diluted with turpentine, benzine or some similar solvent. The liquid may be applied with a brush. They believe that the heated metal converts the asphalt, or part of it, into a gaseous cushion between the molten mass and the mould, and in that manner the chilling action of the latter is modified. But whether this be the correct theory or not, the results are said to be incredibly excellent. Indeed it is alleged that large screws may be cast by this method at one-third the cost of turning them, and that the product is equally smooth.

A Buffing Room.

There are many shops where the intelligent adoption of a buffing department would work wonders in saving time and labor on much finished work. Even if you have not work enough to employ a buffer steadily, it will pay to have the proper appliances and get a man who can turn his hand to other work in the spare moments, although it would be saving money over present management to give him half or even full pay when not employed. In finishing brass, iron or steel casting, or forged work, the saving effected by good buffing-wheels and straps, handled by an experienced man, seems incredible to those who are accustomed to using the file, scraper and emery-cloth block or stick, and the uniformity and quality of the work will be much improved.

The quality of wheels and straps, emery or other abrasive supplied will affect the saving largely, for it does not pay to use poor materials. Solid wheels, wooden wheels with leather faces or rims, hide wheels and felt wheels are all good for certain work if of good quality, and the same may be said of rag wheels and polishing materials. The wheels should be well balanced, especially the larger sizes, and should run about 5,000 feet per minute, rim speed. This demands strong wheels, and they should be carefully looked after to avoid bursting and injuring the workmen. In renewing the emery on the rim the old and worn material should be thoroughly removed by covering with damp clay; this will loosen the glue, and it can be easily scraped off after the glue becomes softened. This is far preferable to the "picking" or "chopping" method employed by some, as this injures the face of the wheel and is apt to make it run "out of true."—Machinery.

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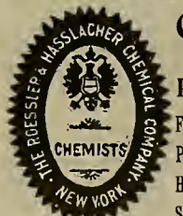

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Electrical Progress.

Electric Lights Reduce Crime.

When Henry W. Jaehne was alderman he introduced and had adopted an ordinauce which provided for the lighting of West street by electric light, says the New York *Sun*. One early and good effect of this innovation was that the ueighborhood, which had previously been the resort of river thieves, footpads and miscellaneous criminals after the hours of nightfall, was much improved, and robberies ceased to be of frequeut occurence.

The neighborhood is one much frequeuted by market men, Clinton market being at the foot of Spring street, and Gansevoort market further north ou the same side of town. Mauy persons are obliged, by the demands of business, to traverse this portion of the west side late at night, and some of them find it necessary or desirable to carry with them considerable sums of money. The records of the Prince street statiou show, or rather did show until the station house was removed to Macdougal street, that following the introduction of these electric lights, robberies, previously numerous, dimiuished rapidly in this locality.

Since theu electric lighting has become pretty general in the streets of New York. Broadway, the Bowery, Eight avenue, Third avenue, Fourteenth street, Grand street, Park Row, One Hundred and Twenty-fifth street and other thoroughfares are now almost as well lighted by night as by day.

During the time that flickering gas lamps were depended upon for the illumination of the steets of New York, persons traveling at a late hour had very little protectiou from assault, as it was not possible for policemen, however faithful and diligent, to cover all posts. It was always in the power of thieves to "turn out the gas," thereby leaving a street in temporary darkness, and subjecting always a belated pedestrian to the libability of sudden and unexpected assault.

In the year 1884 there were 316 arrests—or one for every working day on the average—for street robbery in New York city. In 1885 the uumber increased to 332. Then the improvement in illumination came into effect, and in the year following the number of arrests for robbery was ouly 291. In 1888 it had falleu to 270. In 1890 it was 253. Iu 1892 it was 239, and last year the total number of arrests for robbery was only 232, showing the close counection between the diffusion of electric lights and the suppression of this form of felouious crime.

During the years succeeding 1884, the population of the city has been steading increasing, of course. If, therefore, the number of robberies committed in each year had remained precisely at the same figure, the ratio of robberies to the population would have steadily decreased, but there has been a double reductiou, for there are now fewer robberies than there were ten years ago in New York city, and the population has greatly increased during that time.

By the last report of the Commissioner of Public Works it appears that the city is paying for the lighting of 27,500 lamps, about 2,000 (mostly in the big thoroughfares) electric and the remainder ordinary gas lamps still in use on the side streets. The item of gas and electric lighting costs the city in a year about $900,000.

Refining Copper By Electrolysis.

For nearly forty years, beginning with 1845, the chief source of supply of domestic copper in this country was Michigau, the percentage coutributed by that State rauging from seventy to ninty per cent for a long time. Early in the 80s, however, Arizona became a conspicuous second in the list of producers, and then Montana quickly passed both that Territory and Michigan. She has held the first place for the last seven years. The resultant abundance has euabled us to export this metal largely, the amount seut abroad for the last decade averaging one-sixth to more than a third of our whole output, and the price falling to au astonishiugly low figure.

Of the total product of Montana, much the largest part (about three-fourths) now comes from Anacouda, with Butte a conspicuous secoud. For a time Anaconda sent a good deal of her smelted copper to Baltimore to be refined. But an euormous plant for couducting that operation by electrolysis has been erected at this chief center of Americau production, and, though uow only partially iu operation, it will soon be turning out fifty tons of pure copper a day. The Anaconda company meditates putting up a similar plant at Great Falls, Mont., nearly 150 miles away, where cheap coal and a magnificeut water power are available. The Butte companies have already been doing this for some time past. Even at Anaconda the work can be done for three-fifths of a cent per pound, and, therefore, the cost will be much less at Great Falls. As yet, the Anaconda company is able to refine only 30,000,000 pounds a year, which is less than one-third of its entire product; but it is arranging to refine the whole of its as soon as possible.

Copper and aluminum are the only metals produced on a large scale by electrolysis at present, but a large number of rarer ones are also separated from their salts aud other impurities in this manner. The plan pursued with copper is as follows: A large number of tanks are used, all containing a saturated solution of sulphate of copper. Into each are inserted the positive and uegative poles of a heavy conductor from electric generators. Separate couductors are not used for the different tanks, but the latter are placed "in series," so that the current flows from the positive terminal or cathode in one bath through the liquid to the anode, or negative terminal, and then along the conductor into the uext tauk, where it again leaps from the cathode to the anode, and so on. Upon each anode, which is an immense flat plate, is affixed a thin sheet of pure copper, to start the deposit, while huge slabs of the impure metal from the smeltiug furnace are attached to the cathodes. As fast as pure copper from the sulphate is deposited on one pole, the liberated acid attacks the slab at the other. By degrees the one mass grows and the other diuinishes. The impurities settle iu the tank as mud, and every so often a uew, clean bath needs to be prepared.

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Practical Information.

Preventing Fly-Wheel Accidents.

An accident which is occasionally reported from cottou and rolling mills and other factories, but is of more frequent occurrence iu electric lighting and power plants, is the explosion of fly-wheels. For this reason, and also because the immediate effects of such disasters are liable to be felt outside as well as inside of the latter class of establishments, engineering experts have recently been discussing in the pages of *The Electrical World* the superinducing causes of the catastrophes in question. One authority, T. C. Coykendall, traces the trouble to the sudden imposition of a heavy load on a wheel, which already has great momentum; others blame the pattern and construction of the fly-wheel itself; aud others offer still different explanations. The weight of opinion, however, seems to hold the engine-governor responsible for most of the explosions, and to make the latter a result of a sudden lowering or cessation of load. In manufacturing establishments the variations in the consumption of power from one minute to the next are trifling compared with those in electric plants, especially iu the power houses of a trolley line. The sudden stops and starts of a car, the change of grade, the brief blockades that bring several cars to a standstill and thus lead to au almost simultaneous resumption of headway and other causes, produce a continual fluetuatiou in the consumption of power which is embarrassing. Moreover, there is always a chanee of a short eircuit from a "cross" or a "ground" out on the line, which paralyzes the serviee, and instantly relieves the engine of strain. There is, therefore, a constant jerking and shaking of the governor; and if a key comes out, or a belt slips off the pulley, steam will not be shut off. The engine then goes a-racing, and the speed of the fly-wheel rapidly increases, until the centrifugal force exceeds the cohesion of the material. Hence, Professor R. H. Thurston. of Coruell University, Dr. Charles E. Emery and other experts recommend the use of governors of the best type and frequent inspection thereof.

In this connection it is worth while to mentiou that wrapping the rim with about 100 layers of stout manila paper, haviug glue between them, has been proposed as a safeguard against this class of accidents. Fly-wheels might be made with less metal than usual, where this weight is to be added.

Ball Bearings.

Commenting on the growing introduction of ball bearings, which, as may be remembered, first found praetical use in diminishing the frietion of bicycles, Dr. Coleman Sellers, in a lecture at Stevens Institute a short time ago, pointed out that one of the most notable examples of the use of the balls is to diminish the friction of the collar that sustains the hook of a large crane. Without these balls the difference between the friction of rest and the friction of motion is so great that men are often seriously hurt by endeavoring to turn a load suspended upon the crane hook, which requires a great deal of exertion to start it, and when it does move, goes farther than is intended, often leading to serious accidents. By making the crane hooks with flat washers, between which numerous small balls are placed, resting on hardened surfaces, there seems to be no difference between the friction of rest and the friction of motion, and hooks heavily loaded are turned with remarkable ease, so that the use of balls, distributed over plane surfaces, is quite common, there being no basket or grooves to separate the balls, which latter are allowed to move at their own will in whatever direction they are inclined to go. There is very little literature on the subject, and the theory of ball bearings has not been worked out and published. It may be interesting, however, to know that some experiments have been going ou for some time past in referenee to the size of the balls best suited to the different purposes. In the case of hooks for cranes carryiug about fifty tons, betweeu 250 and 300 tons, each of three-eighths inch diameter, are scattered between the flat plates, with the idea that the more points of contact the longer the belts will last, but some experimeuts are now being tried with balls of different sizes, and motion kept up under loads to determine their durability, with a leaning iu favor of larger balls and fewer of them.

It would appear from the reeent experience with the torpedo boats Cushion and Stiletto in stealing into Newport harbor without being observed, in spite of the fact that officers, forewarned of their approach and armed with the best modern search lights, were statioued at the entrance of the harbor, that a torpedo boat should be reasonably secure agaiust destruction by shot from a naval vessel approached under cover of darkness, where no warning is giveu of its approach and the search light is utilized for illumiuating the whole horizon.

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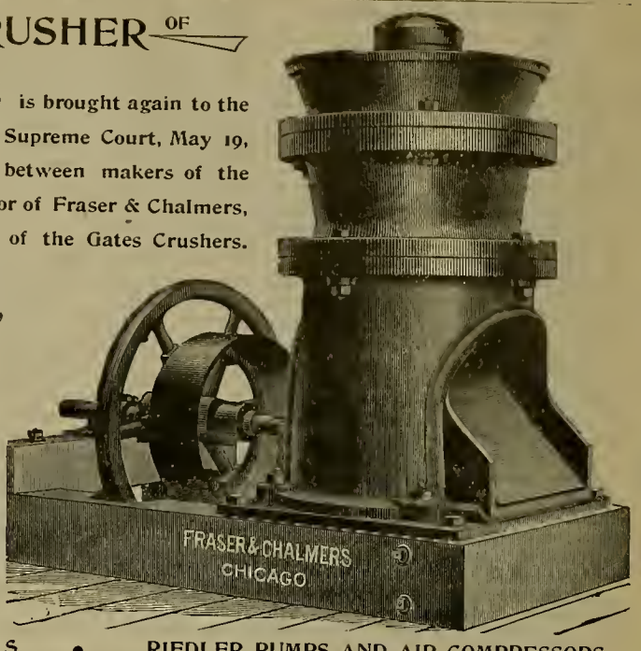

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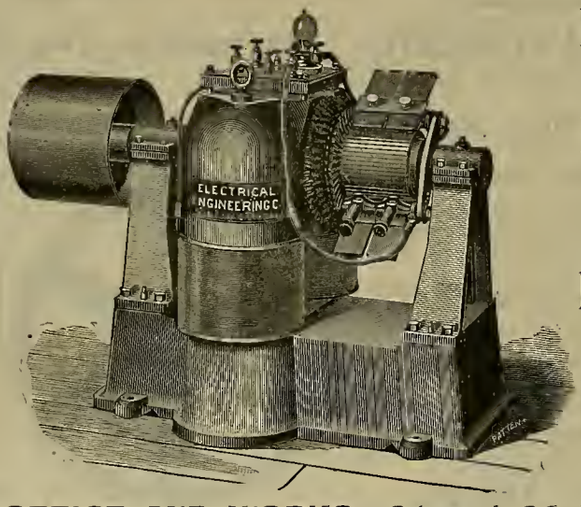

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Industrial Occupations.

In the huilding up of the industrial structure of any nation there is a continual series of changes. Industries rise and fall, or are being continually suhdivided. As they are simply the ministers to man's wants, real and fanciful, their complexion and importance are in many instances of a fickle and erratic nature. In these changes we not only note the progress of science, invention and enterprise, hut the special industrial conditions, which are the unerring finger points to needed reform or legislation. What the people of a nation do to earn their hread, to huild up their trade and to furnish the sinews of government, is not only a matter of concern to themselves, but of example or of warning to others. The rise or the fall of this or that industry, the drift of population to the various forms of production, and the effects of these changes on competition and international commerce are among the most valuahle, though too often overlooked factors, in shaping the destiny of nations.

In the character of a nation's industries we have the key to its history, says the *Age of Steel*. Napoleon, in the usual military derision of husiness, satirized the people he failed to conquer as a "nation of shop-keepers." They made steel and wove cotton, perspired at forges and delved in mines, and what came from the anvil, the loom and the mine found their way into every nook of the planet and crowded the seas with commercial navies.

The axis of empire was in the workshop and the market. So it will ever he. The greatest nation will always be the husiest. In this lies the vital secret of the highest statesmanship. In the change of industries we see the inevitahle with nations as with trade. As a study and illustration of this fact, we note an ahle review of the industrial situation in Great Britain in a recent numher of the *Free Review*. In a general classification of occupations for ten years the following tahle is of significance and interest:

	1881.	1891.
Professional	647,075	926,132
Domestic	1,803,810	1,900,328
Commercial	980,128	1,339,735
Agricultural (and fishing)	1,313,184	1,336,945
Industrial	3,373,367	7,336,344

In the marked decline in the numher of purely agricultural laborers, which fell from 870,798 in 1881 to 780,807 in the last census year, we see the results of falling prices in home products, owing to the competition of America and other countries in the grain and cattle markets. In the machinery and tool-making trades, ship-huilding and other equipments of transportation, there has been a great growth during forty years, the last decennial period showing an increase of over twenty-seven per cent. Again, the *Age of Steel* says that the persons engaged in the iron and steel trades advanced from 361,343 in 1881 to 380,193 in 1891, the increase, however, being below that of the population. In the coal-mining industries there has heen a remarkable increase in the number of miners, rising from 381,963 in 1881 to 517,110 in 1891, it heing somewhat strange on the surface that, while the numher of miners increased thirty-five and one-half per cent, the output of coal increased only twenty per cent. In the cotton and woolen industries, though, the output has made a marvelous increase; the proportion of lahor engaged is continually diminishing. In the furnishing trades, china, earthenware and glass manufactures, the workers have kept pace with the growth of population. In the manufacture of electrical apparatus, gas, watches, printing and hicycles, and in industries, whether machine or handwork, which supply some luxury or some peculiarly modern want, there has heen a rapid expansion of employment. In Great Britain, as in the United States, merchants, hrokers, agents, commercial clerks, speculators, bankers and insurance agents show a phenomenal increase. Men engaged in furnishing professional and personal services increase much more rapidly than those engaged in producing and distrihuting more substantial factors of material wealth. The richer a nation, the more its demands for luxurious service. Is this the initial of decay?

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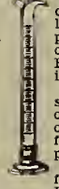

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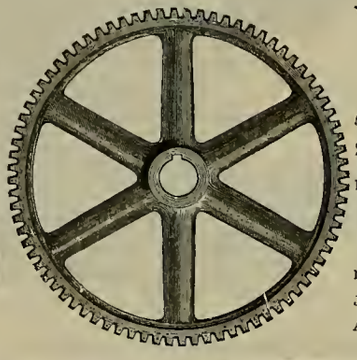

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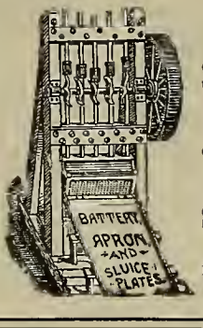

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The Miners' Convention.

(*Continued from page 340.*)

MR. CAMINETTI: We succeeded in getting $100,000 put into the bill, and at the end the question was asked: "Let us see that bill that the California Legislature passed. Can we get $100,000 from the California Legislature to add to this $100,000?" Under the law as it then stood of course that could not be answered in the affirmative. I really believe that at the time Senator White secured that action of the Committee on Mines and Mining, that if the Senate had had the authority to say from the Legislature of California that $100,000 could have been had to add to the $100,000 asked of the two Houses of Congress, that we would have passed that appropriation. I hope you will not meet that condition again, but that you will get the $250,000 to put side by side with the appropriation of this State, which the Legislature so munificently voted. If, however, you can only get $100,000 or $50,000, as the case might be, it might be well to provide that in case Congress appropriated the last amount, that a like amount be appropriated to the Debris Commission. I think a great deal of good might come from that, and I see no objection to it. Provided you cannot get the whole $250,000, then come down in case it is necessary.

MR. SHERWOOD: We cannot use a dollar until we get $250,000 appropriated by the general Government. We cannot use a dollar of the $250,000 provided for in the Act of the Legislature of California. I want to say this, and I think I can say it with some sort of safety, that the engineers of the Government have been getting points as to the necessity of building a restraining dam at Deguerre Point that has been reported on by three different engineers. The only question that has arisen with this gentleman and the other gentleman who has represented us was, "How much can we get?" You cannot get anything if you do not get a starting point. If you have a limit that you cannot take anything without you get your $250,000 from the Government, and $250,000 from the State of California, you are still waiting. I want this convention to say that whenever the United States Government will appropriate $50,000, or by act of the Secretary of War will authorize work to be commenced on Deguerre Point or any other point suggested, that the State of California, by its Commissioner, shall be authorized to appropriate the same amount of money, whether it be $250,000 or $50,000. My amendment is a less amount.

MR. KELLOGG (of Plumas): The $250,000 appropriation will not lapse until some time next spring, and therefore it will be impossible to change the present law now to act with the present Congress, and if we send a resolution in March next showing that California appropriates $250,000, we hope that we will get it.

MR. SHERWOOD: I want this Legislature that is elected in California now to provide in the bill that if a less amount than $250,000 be appropriated, whether it be $50,000 or $250,000, to be used in connection with the Commissioners, this shall be provided for the State of California.

MR. SEARLES: It may be very well to say that we are in favor of the passage of a law by the Legislature of this State to appropriate $250,000 to be expended in a given manner when the Government of the United States shall have appropriated the like sum. I am not finding fault with the idea advanced here, but with the manner in which it is stated. I say it is neither English nor sense, and it meets nothing.

MR. F. R. WEHE (of Sierra): There seems to be a sentiment in favor of this resolution, and I move that it be referred to the Committee on Resolutions, to be reported back in accordance with its views.

The question was then put on the amendment offered by Mr. Sherwood of Yuba, and the amendment was lost by an unanimous vote.

Mr. Filcher of Placer then extended an invitation to the Association while in the city to visit the rooms of the State Board of Trade, where all the industries of the State are represented' and where each and all are cordially invited to call.

THIRD DAY'S SESSION.

The third day's session of the convention commenced at 9 A. M. on Wednesday. The Committee on Legislation, through its chairman, Mr. Tirey L. Ford, here presented its report, which was prefaced by the following remarks by Mr. Ford:

"In presenting the report of the Committee on Legislation, I wish to say that we found a great many things to look into. There were representatives on the committee from adjoining States, such as Washington and Nevada, and there were many things besides hydraulic mining that engaged our attention. The committee came to the conclusion that it was wise to make as few changes as possible, consistent with the mining interests in the West. The time, doubtless, will come in the near future when a complete revision of the mining laws will be necessary, and the enactment of a new code of mining laws in the United States will be made. That time has not yet arrived, however, and the committee did not deem it wise to deviate any further from the old law than seems to be absolutely necessary to subserve the mining industries of this country. I might say that these changes conform very nearly to the so-called Newland's Bill introduced in Congress by Mr. Newlands of Nevada, which bill was drafted here and sent to him, and it is drawn on those lines."

Mr. Ford read the report of the committee, and on motion of Judge E. A. Belcher of San Francisco, the report of the committee as read was unanimously adopted. The report was published in the PRESS last week.

Mr. Tozier of Nevada then made the following remarks: "I have listened to the reading of several reports made by your respective committees, and I have failed to hear anything on the subject of the Nicaragua Canal. I have this morning hastily prepared the following resolutions which I ask to read, because my hand is now somewhat shaky, although my head is clear and my heart is upon the questions that affect the welfare of the mining and agricultural industries of this State, I being at the present moment a member of both those organizations. I shall read the resolution and ask and urge its passage, and ask other gentlemen to do the same:

WHEREAS, The early completion of the Nicaragua Canal under the auspices of the Government of the United States, substantially as provided for by the so-called Morgan Bill now pending before Congress, is a measure of very great importance to all the industries of the country, and especially so to the Pacific Coast States and Territories; therefore, be it

Resolved, That our State Legislature and our Federal Congress be memorialized and requested urgently to use their best efforts to secure the earliest possible enactment of laws to enable and secure the early building of said Nicaragua Canal.

Upon motion of Mr. Voorhies of Amador, the resolution was, after being seconded, carried unanimously.

The chair announced that he understood the Committee on Legislation to be a permanent committee. Mr. Ford, the chairman of said committee, then stated that he did not so understand it; that the previous committee had acted but one session, and that he supposed it would be the same this session. The chair announced he believed that committee to be composed of the very ablest men of the Association, and thought that the committee could be continued permanently to the very good advantage of the Association. On motion of Mr. Fulweiler of Nevada county, which motion was duly seconded, it was unanimously carried that the Committee on Legislation be a permanent one to act for the Association until its next session.

Mr. Fulweiler of Nevada then offered the following resolution:

Resolved, That a committee of five members of this Association be appointed by the Chair for the purpose of formulating a plan for the establishing of a miners' exchange or bureau, said plan to be reported to the Executive Committee at least sixty days before the next annual meeting of this association.

Resolution was signed by three members of the convention.

Mr. Fulweiler then made the following remarks on said resolution: The resolution as presented to the Association is simply a means of following up the suggestion presented to this convention yesterday by the Hon. C. W. Cross. It is of course general in its nature, so far as the resolution is concerned, but its object and purpose is to form an association with a head here in the city of San Francisco and branches in every county in the State, if necessary, from and through which information may be gained to the end that those desiring to engage in mining enterprises and invest their money in the purchase of mining property, or to loan money or otherwise on mining engagements, can receive information sufficient to justify them in the investment of their money, their enterprise and industry. The object I have in view is much broader than the one here presented. Another gentleman thought it better to present the resolution which I have presented rather than the one I am in favor of, which would be the establishment of a miners' savings bank, in which miners would take stock and invest their money, and in which all miners would deposit their savings; the moneys deposited in that bank to be loaned upon mining property, and to be used in the development of mining property, and not for farms or real estate; to have experts examine all mining property in this State, so that a man could go there and ascertain that property, and there would be no middleman to charge for examining the property. It would be a bureau. If it was a bank, as I suggest, it would be to keep the run of the titles to all property, and therefore foreign enterprises could go to that institution and get any information, reliable and honest, upon which they could get this information. I agree to this proposition, however, stated in the resolution because it is only a step toward the accomplishment of that purpose; but I tell you, fellow miners, that you must depend upon yourselves and put your money where you can handle it and where it will benefit your old home, your firesides and your property.

On motion, duly seconded, the resolution was carried.

THE PRESIDENT: We have with us this morning, by invitation, a gentleman recently elected to Congress, who has been invited to address this Association. He is an able gentleman, a flowery speaker, and I think a true American. I call upon the Honorable Grove L. Johnson, Congressman-elect of the Second District.

Mr. Johnson came forward, was introduced by the president, and made the following remarks:

Mr. President: Unlike my friend Fulweiler from Placer county, I am not a miner. I never have been a miner, but if the Lord gives me life, and I think he will, I expect to represent the counties of the State of California in the Second Congressional District, in which most of the mining in this State is carried on. If I live I also expect to represent a portion of the State in which farming is carried on. I will therefore represent both interests. Knowing you, and you knowing me, I desire to say to you as friends, as one man to another, that if I am spared, and am able to take my seat in Congress, to which your kindness has elevated me, that whatever I can do honorably and legitimately to advance the interests of the miners of this State will be cheerfully and heartily done. I am heartily and thoroughly in favor of the National Government taking hold of this matter and assisting the hydraulic miner of California and enabling him to resume his business. I believe the National Government will do it.

During the campaign which has just closed I so stated to the people of the Second Congressional District. I meant what I said then, and I mean it now. I care not what course others may take I care not what resolutions may be adopted here or elsewhere. I care not what fear other people may have with reference to the matter. For one, I meant what I said during the campaign, and I mean it now, that if I live to reach Congress I shall labor to have the National Government take hold of this matter. I am willing to work untiringly and unceasingly to support the resolutions adopted by this Association last evening, to obtain anywhere from a million to thirty thousand dollars from the National Government to enable this work to be carried on. I think it is proper. I read in this morning's papers that my neighbors think it is not proper. I disagree with them. I recognize those persons as men interested in the Second District and in the State, but their views of governmental policy differ from my own. I recognize this Government as one for the benefit of all. I believe the National Government made an implied contract with the miner when they sold him his land that he should be permitted to carry on mining. If from the decree of the court it should be thought I to turn out that mining cannot be carried on without injury to the people of the valley, and therefore the decree has gone out, as being enforced, that mining of that character shall not be carried on, I believe it to be the duty of the National Government to come to the rescue of the miner, with whom it has made this implied contract, and enable him to benefit himself in the way he has benefited the State and the whole world.

I am glad to be with you to-day. There has also been published the resolution or address of another association which seems to antagonize your movement, and I desire that no misunderstanding shall exist as to my views, of however little weight they might be. I desire the people of the valleys and of the mountains, of the farm and of the mines, to understand that I meant what I said after election as well as before, and that after election I endorsed the views that I expressed before election.

As to the other matters contained in the resolutions adopted by this Association—for instance the matters contained in the report of your Committee on Legislation—I frankly confess to you that I am unable at the present time to give any opinion on. I have not examined sufficiently into them to enable me to say at the present time whether they should be changed in any particular. If these matters come before me, either as an individual or as an officeholder, I can only say that I will look into them thoroughly and will weigh all the arguments, pro and con, and will do all in my judgment that I think is right between all the people of this State.

As I said, I am not thoroughly conversant with those matters. I can only repeat what I said before, that whatever I can do to advantage the miner, whatever I can do legitimately and properly to enable him to obtain title to his mines without owners' conditions and without burdensome legislation, I will do, in season and out of season. I do not understand these matters sufficiently to say now that all the matters contained in your propositions are correct or that all of them need to be supported by this Association or by any person who may represent the people at the national capital.

I rejoice at this convention and the spirit which governs it. Two years ago this Miners' Convention met in this hall, and the same man was chairman then who is now chairman, and long may he live to be the chairman of miners' conventions and to greet us all as friends. In that convention I had the honor to make some remarks and to say to the people then represented that although I lived in the valley, I believed in the cessation of hostilities. I believe that the farmer and the miner should work together. I believed then and I believe now that it is a libel on the intelligence and the inventive genius of the American people for any man, or any convention, or any newspaper, or any lawyer to say that there is no way out of the difficulty. And when any man attempts to say that this mining question cannot be solved, or any man attempts to say that it is utterly impossible to carry on mining in this State without injury to the people, or without injury to the valley, in my judgment he insults the intelligence of the American people. I have faith in the people. I have faith in their learning. I have faith in their abilities. It only needs for us to pull together. It only needs for the miner and the farmer to realize that their interests are identical. It only needs for us to look at the matter in a broad, liberal view and then we can succeed. And I, living in the valley, representing in part the people of the valley and all my interest in the valley, say to you as one man, knowing what has been done in the past and knowing what is being done in the present, that I believe that there is an engineer somewhere—I don't know where—that there is a man somewhere—I don't know who he may be—who will solve this question; and if the means already suggested are not adopted or sufficient, that other means will be suggested and that other means will be adopted, and that final success will reach both parties. What benefits the miner benefits the farmer, and what benefits the farmer benefits the miner. I am not interested in farming and I do not know much about it. It frequently costs a miner $1.10 for every dollar he extracts from the mine, and in that case it is a benefit to the nation and the State, whether the miner gets the money or not. He puts the money into circulation, however. Therefore, as a selfish people, we are interested in it. Of course we do not want the mountains to come down on us in a sudden way and get entire control over us, as it has in the past, when we fight against it; but if it can be brought down in such a manner as suggested by my friend Rose, I will be glad of it. I am glad I have read Mr. Rose's speech, and I wish I had heard it. I believe that is a matter that should be examined into, and I believe the Government should give its attention to it. It seems to me that if that proposition were properly worked out it will be the solution of the problem. If that can be done, it resolves itself down to the proposition of how much money the national Congress will appropriate for that purpose; and they will give it to us.

I desire to say, in conclusion, that I do not want anybody to misunderstand me, and I beg pardon if I speak much about myself, for, as you know, the district which I have been elected to represent in the approaching Congress contains, as I said before, nearly all the mining counties of the State. I live in California and I live in the valley, and I told the people in the Second Congressional district, both in the mountains and the valley, that if I was elected to Congress I would labor for the miners and I would labor for the farmers; and I pledged myself then and there to labor for Government and to the miner. And by the blessing of God I will keep my promise that I made to the people.

THE PRESIDENT: We have in this hall a distinguished gentleman of California, now doubly so by recent events. I allude to the Hon. Jas. H. Budd. Budd then addressed the Association as follows:

Gentlemen of the Association: I am not able, my friends, to enter into any discussion of the matters that have occupied your time and consideration. I desired to be here during the first day of the meeting, but was confined to the house by the orders of my physician. I went out to the sea to visit the next Mayor of this great city. While there I made a few remarks, and the result of that visit was that the doctor told me I would not be next Governor of California, if I did not remain in the house and in bed for the next two or three days.

As to the matters which you are deliberating, you have my utmost sympathy, and any proper measure in the line of your deliberations that may come before me as Governor, will not only have my approval, but when it is in the House and in the Senate, it will have my energetic and hearty support.

This is not mere talk. You of the old Second Congressional District will remember, that when in Congress representing that district, I recognized the duty of the national government to put all of the energetic power of the Government, all of its engineering ability and all the treasure necessary, into the endeavor to reconcile the antagonisms between the two interests. In that behalf, Mr. Chairman, I introduced a bill appropriating the sum of $500,000, which bill did not pass, because, I might say, it had not the united support of the State of California.

During my canvass for Congress some years ago, and during my recent canvass for Governor, I stated to the people that the national faith was pledged to both these interests. It was pledged to the miner and it was pledged to the farmer; to the miner who entered upon his claim under a patent which authorized him to work for the

gold; to the farmer that tilled his land and felt that the Government having given its encouragement to him, it was its absolute duty to see that those two absolute industries were carried on side by side.

As my friend Johnson said, a man should be in an insane asylum who will not recognize that engineering skill, properly backed by the Federal Government, will show that mining is properly carried on as in the past, without injury to the industries of the valley.

Whatever you may do in this behalf will meet with my hearty co-operation. I do not believe there is any real antagonism between the two elements. I am a farmer myself upon the rivers, with lands that are frequently overflowed. I think it is the duty of the Governor of the State to do what he can in the interests of both.

I am sure that California is to-day in a more prosperous condition than it has been in the past. In traveling through the old Second Congressional District, I find more old mines re-established and being put in operation than there were before, and I find that the homes that were desolate in the past are beginning to blossom, and I believe the faces that were so long in the past are to-day smiling.

MR. LANE (of Calaveras): I have a resolution here which I wish the Secretary would read.

The resolution was then read by the Secretary as follows:

Resolved, That the California delegation to Congress he requested to take the necessary steps to organize the Senators and Congressmen from the mining States and Territories into an association for the protection of mining interests in Congress.

The resolution was referred to the appropriate committee.

The afternoon session was held in Pioneer hall at two o'clock.

The Committee on Resolutions, to whom was referred the resolution offered hy Mr. Lane of Calaveras, reported, recommending the following suhstitute for the resolution:

The Committee on Resolutions recommeud that the representatives of California in the National Congress be requested to take such steps as may he deemed proper to organize so that they can work as a unit on legislation affecting mining matters in the Congress of the United States.

On motion of Judge E. A. Belcher, of San Francisco, which was duly seconded, the substitute offered by the Committee on Resolutions was unanimously adopted.

The president then announced that the next order of business would be the reading of a paper hy Mr. Crawford, State Mineralogist.

THE PRESIDENT: I will call on Senator Campbell of Siskiyou. He has a paper which he will read to us on the subject of "Hydraulic Mining hy the Elevator Process." [This is given in another column.]

The president then announced the appointment of the following members at large of the Executive Committee: Charles G. Yale, C. W. Cross, H. Pichoir, Thos. R. Church, A. Carrigan, A. L. Scott, S. B. Christy, R. McMurray, Edward Coleman, E. C. Loftus, A. H. Ricketts, J. J. Crawford, W. W. Montague, Tirey L. Ford and S. K. Thoruton.

MR. BUSH (of Shasta): I desire to ask if there was not a resolution passed hy this Association in regard to the opening of the Sacramento river from the town of Red Bluff to the town of Redding? The resolution was presented in good faith, aud it should obtain your favorahle action when you go home.

THE PRESIDENT: I will say that Judge Bush has stated the fact, and that Redding can he made the head of navigation of the Sacramento river, and I hope that your representatives in Congress will take action on that point.

MR. ————: I notice that the Anti-Debris Convention which was in session at Sacramento, declares itself hostile to auything this convention shall do. I would suggest that the Executive Committee of this Association appoint a committee of three from each local county organization to assist the members, both in the House and in the Senate (at the time this matter comes up in the Legislature) in pushing it to the front. I move that the Executive Committee of this Association ask the county association to appoint a committee of three of their several associations to go to Sacramento during the session of the Legislature and urge the passage of such matters as redound to the success of hydraulic mining.

MR. REARDEN (of Calaveras): I think that is a proper matter to go to a Committee on Resolutions, and I make that point of order.

THE CHAIRMAN: It is on the form of a motion, and uot a resolution, and the poiut of order is not well taken.

On motion, duly seconded, the motion was unanimously carried.

THE PRESIDENT: Gentlemen, we have with us a man who carried on the Pony Express across the continent, and I call upon Col. Majors.

Col. Majors was introduced by the president, when he made the following remarks:

Mr. Chairman and Gentlemen: You have already been informed I am one of the company that ran the Pony Express to this country in 1860. The distance of 2,000 miles was made in ten days and nights, without a single failure having occurred in the entire time of the twelve months that the Pony Express run from St. Joseph, Mo., to California.

The object of the Pony Express was first suggested to my partner, Mr. Russell, in Washington City, by Senator Gwin, who at that time represented your State in the Senate of the United States. He had been trying to do something for you people in this country in the way of securing a thoroughfare from the East to California. In speaking upon the subject in Congress they would tell him it was impossible to make a direct line from the Eastern States to this country, but that it would have to be a circuitous route by way of Los Angeles, El Paso, Texas, and Fort Smith, upon the Arkansas, to St. Louis, which was in about rainbow shape. Mr. Russell was at that time running the daily stages from St. Joseph, Mo., to Salt Lake City, a distance of 1200 miles. They had organized and built stations at a distance of about 12 miles apart for the entire route. Senator Gwin thought there were no other company or persons in the country so well prepared to carry out that proposition, and he therefore approached us. We thereupon started the Pony Express in order to show the people of the United States that the routes could be traveled winter and summer without any delay from the storms, which they claimed would render it impossible to do so. After that demonstration was made, and satisfied the entire country that such a route was practical at all seasons of the year for operations of that kind, there was a law passed to build the Central and Union Pacific Railroads upon that line. That is the benefit and effect that this or any other portion of the country received from the enterprise called the Pony Express, which was inaugurated for that reason.

When the Pony Express ran through the country and never failed for a single day, through high water or low water, rain or shine, it settled the question. That experiment cost us over $200,000, which was virtually thrown away; but the benefit to the country was worth millions.

Since the advent of the railroads and the telegraph, the enterprises that I used to be so prominently connected with, and the principal conductor of, have passed from view, and my calling being thus entirely "played out" by their improvements and industry, I went into the mining business. If you can ever bring forward a man that is more in sympathy with the mining industries of America than I am, just bring him forward. Overland railroads, Pony Expresses, anything and everything that has been inaugurated in this country, has never done so much for it as the mining industry. There are tens of thousands of miles of railroad running to-day along places that are so precipitous that a grizzly bear would have never dared walk over before, that have been projected and constructed solely through the mining industry. There are to-day thousands of homes between the Missouri river and the Pacific ocean that would not yet have been developed if it had not been for the mining industry. The greatest shame that I could know that could come upon the representatives of the country, from the President down to the Congressmen of the United States, is that they have not appreciated this tremendous industry for the American people.

Gold and silver are to-day the aids of civilization and mining, and you cannot have them without it. Whoever places an embargo upon it, or anything that would be calculated to cripple or retard the mining industry, is opposed to civilization, and to the best interests of our people. I care not whether it is the President of the United States, or Senator, or Congressman, he should be condemned by every intelligent man or woman in the land.

Gentlemen, I was brought to the front of the State of Missouri when it was thought that it was the very verge of civilization; there I was brought up with the bears and the wolves. I recollect that three Frenchmen were the only motive power to carry people across the Missouri river for people coming West.

Nothing ever gave us such energy and such widespread enterprise and such indomitable push forward as the people of the United States had when gold was discovered in California in the winter of 1848. There was a new period then arose in the entire country—not alone in California, or in the adjoining communities to it, but a new era arose in the entire United States of America.

Every man in the entire United States was benefited by that result. I am ashamed of men when I hear them say, "Oh, you are a mining State, you little people out there; you want to control this whole country because you have a few mines." Oh, I am ashamed of such people! Gentlemen, *I am history!* I do not have to ask some newspaper correspondent or some banker in this city or some other man who pretends to be a great economist. I have lived through it.

We want the mining industry encouraged. We want gold and silver, and we want silver remonetized at the rate of sixteen to one; and until that is done, this country must suffer and continue to suffer. Talk about good times as much as you please, or one political party coming into power to make good times, until they repeal or change some of the laws already made, or make better ones in place of them! You will not have permanent prosperity in this country, say what you will.

As I before remarked, I am history. We have had a great flop recently in the election. You let a man lie down on this floor here for two years and he will get very tired of it; and while he may turn over on the other side, it is no better than on the other. That is all there is in this tremendous flop. Not a single issue in this vast change—not one. It is tariff, tariff, tariff, and it will not life you by your neighbors' boots. We must have our mining industry restored in the very fullest sense of the word, and if you gentlemen do not go about it there will be such a dearth of business as you have never seen during your whole lives in this land. Money is going to become more scarce instead of more abundant unless you have some way for the laboring classes to meet the prices that they must meet in order to enable them to live. These men who, at the expense of all the other people in the country undertake to impoverish their neighbors merely to become millionaires, should be ashamed of themselves.

A gentleman met me on the street and said, "Majors, you ought to be a millionaire." He knew what I had gone through in this country. I said, "If I was a millionaire to-day, I would not be one to-morrow." He said, "Why?" I said, "Because I have seen so many people that need a portion of it so much more than I do that I would dispense with a portion of it surely."

Gentlemen, no man in the world can make a million dollars honestly, unless his advantages have been a thousand to one almost of what the ordinary men of the country have—unless he has made it out of a mine. He has robbed nobody if he finds a bonanza, and that is about the only way that a man can become a millionaire and be an honest man.

CLOSING REMARKS OF THE PRESIDENT.

Gentlemen, permit me to congratulate you upon the completion of your lahors at this session. Three years ago, in opening the session of this Association, I stated to you and to the people of California that we were not collected here, nor were we associated together, to formulate any plans that were injurious to our neighhors of the valley. I helieve that that promise has heen faithfully kept and that whatever the results he, the valley will hear me out in that statement. While a few individuals in the valleys may be keeping up their cranky position toward what we deem the hest interests of the State, I am happy to inform you that the majority of the people are with us in this movement. No one will be injnred if your ideas are carried out upon the lines which have heen formulated hy this Association, in which we have the material interests of this State at heart.

The citizens of San Francisco have heen more than kind to us. While the miner in the mountains has been tied up, and his mine has been laid under an injunction for years, poverty has overtaken him and it has heen as much as he was ahle to do to support his family. He therefore did not have the means to come to this city to attend the meetings of the Association, nor was he ahle to contrihute to the expense of holding the same. But the citizens of San Francisco have generously come forward and contrihuted toward the means of helping us to carry on this work.

I say to the citizens and to the business men of San Francisco, and as has heen stated hy your State Mineralogist, the increased output of gold has shown the good results of our lahors.

Much has heen done, and much more will he done. We have enlisted the interest of all to our cause.

The Association then adjourned.

THE miners who were in the city during the convention have returned to their homes very much encouraged hy the attitude of the merchants, manufacturers and hankers of this city toward the mining industry.

THE North San Juan Mining Company has incorporated. Directors—Henry D. Morris, Henry W. Morris, James M. Livingston, Charles Page and R. T. Harding. Capital stock, $500,000.

A Correction.

SAN FRANCISCO, Nov. 27, 1894.

TO THE EDITOR:—I note that your report of my hrief address to the Miners' Convention, given on page 323 of your issue of November 24th makes me say: "I helieve the determination of the Amy case, as expounded by the Supreme Court of the United States, is what the miners want." This is not correct. What I said was: "The decision of the Amy case hy the Supreme Conrt of Montana is one that is fair and just to the miners—to all of them. I believe the determination of the Amy case as expounded hy the Supreme Court of Montana is what the miners want," etc.

I do not desire to discuss this suhject at length now, but will request you to kindly make this correction. JOHN M. WRIGHT.

A Conservative Opinion.

The following is from the Marysville *Democrat:*

While the present law is in force and the general control of hydraulic mining is entrusted to men of known ability and experience, who have been active and efficient, we believe the people are satisfied and will, when opportunity offers, indorse their acts.

The miners in convention Wednesday last unanimously and enthusiastically indorsed the law and acts of the commissioners, expressing entire confidence in Major Heuer, Col. Mendell and Lieut. Benyaurd. That this endorsement meets with general favor and strikes a responsive chord in the hearts of the great mass of people not one well informed person will deny. And why should it not when we look back and survey the history of nearly twenty years of litigation, in the course of which hundreds of thousands of money was taken from the pockets of the taxpayers instead of from the ground, as is now being done under the authority of law and the direction of the commissioners. At the same time there is very little damage being perpetrated to any other industry, in fact, less than prior to the advent of the Commission. And while this is a fact, it seems to us that a larger sum of money is heing appropriated from the treasury of Yuha county in aid of the Anti-Debris Association than is necessary, especially so when that organization by its own acts negatives the work performed hy these men. Let us he consistent and while the United States is endeavoring to help solve this problem and pay the bills do not spurn the proffered hand.

Concentrates.

THE Frisco mine, at Gem, Idaho, has closed down its works.

THE Convex mine, near Perris, Cal., has been bonded for $20,000. A five-stamp mill will be built.

THE mill at Condon Canyon, Lincoln county, Nevada, has closed down. It will be moved to De Lamar.

IT is reported in Angels that the Utica Mining Company has bougbt the Lightner mine, adjoining the Utica.

W. S. STRATTON of Cripple Creek, Col., has invested $171,500 in mining property in that district since Sept. 15th.

REDUCTION WORKS to cost $50,000 are proposed at Oroville, Cal., contingent on a honus from the citizens of that place.

EASTERN MEN will put $300,000 in an electric plant to furnish the mines and smelters of Leadville, Col., witb light and power.

B. DODGE and A. B. Bowman, of Pittsburg, have paid $12,000 for 160 acres of placer ground on Connor Creek, Baker County, Or.

THERE is a new gold find five miles northwest of Waterman, San Bernardino county, whicb leads to the legal revival of the old Grapevine district.

THE Arizona Bureau of Mines is about to purcbase and erect a complete new plant of macbinery for the treatment of gold ores by the stamping-milling process.

MALTMAN & THOMPSON, the reduction works prrprietors, have bought the New York Consolidated Quartz Mine on Mosquito creek, near Nevada City, Cal.

THE Ohio & Mountain Lion mine, near Henley, Siskiyou county, has been sold to Salt Lake men for $50,000. The first payment of $25,000 was made last week.

PITTSBURG MEN own tbe Nortbern Placer mine, fifteen miles from Quincy. A hydraulic permit has heen issued and a large amount of work will he done next season.

C. D. KELLOGG has hought the Butterfly mine, near Quincy, Plumas county. A lake near hy will he utilized as a reservoir for storage and the mill run hy water power.

FROM Mokelumne Hill come reports of old gravel mines being reopened. There are many former claims in that section that under existing circumstances will pay to work.

THE sale of the Con. Wyoming mining ground and improvements to the Champion Mining Co. for $80,000 is a happy solution of a vexed prohlem in continuous mining litigation.

THERE was received at Baker City last week from the Risdon Iron Works a carload of hydraulic pipe for the Elk Creek Mining Company's mines at Susanville, Grant Co., Or.

A COPPER lode, characterized as "a second Silver King," has been discovered near the head of Kettle river, 120 miles northwest of Spokane. The ledge is said to be sixteen feet in width.

IN Linn Co., Oregon, eight quartz mines and a large area of placer ground have heen bonded in Quartzville district by French capitalists. The development work is in charge of W. B. Lawler of Salt Lake.

DURING October over 3,060,000 pounds of ore and 442,000 pounds of concentrates were shipped from Colorado Springs, Col., to the smelters at Argo and Denver. The greater part of it carried heavy in gold and silver.

THE Centennial-Eureka mine (Utah) paid a double dividend of $1 a share—$30,000 in all—on the 15th ult., the third douhle dividend paid in succession, and the sixty-first and sixty-second dividends declared hy the company.

THE Cosmos Gold Mining and Milling Company is a new San Francisco incorporation, Andrew Carrigan, John Landers, W. B. Sharp, John Pew and W. L. Carrigan as shareholders. The capital stock is $500,000, with $125 paid up.

Official Mint Statistics.

R. E. Preston, the Director of the Mint, has submitted to the Secretary of the Treasury his report of the mints and of the United States assay offices for the fiscal year ending June 30, 1894, as follows:

The face value of the gold deposited is stated as $140,942,545; $38,696,951 was of domestic production, $28,000,525 foreign bullion and coin and $3,118,421 old material; $2,093,615 worn and uncurrent United States old coin deposited for recoinage.

The deposits and purchases of silver during the year were in silver dollars, being $29,409,828; $19,770,700 was of domestic production, $1,832,890 foreign bullion and coin, $6,481,404 worn and uncurrent United States coin and the remainder, $605,036, old material.

The amount of silver bullion purchased under the Act of July 14, 1890, was 11,917,659 fine ounces at a cost of $8,715,522, average cost per fine ounce being $0.7313. The total amount of silver purchased under the Act of July 14, 1890, from August 13, 1890—the date the law went into effect—to Nov. 1, 1893—the date of the repeal of the purchasing clause of that Act—was 168,674,882 fine ounces, costing $155,931,002, the average price per fine ounce being $0.9244. The total coinage of silver dollars under the Act of July 14, 1890, to July 1, 1894, was $36,087,943, consuming 27,911,768 fine ounces, which cost $29,110,647. The seigniorage of silver coined under the Act of July 14, 1890, to July 1, 1894, was $6,977,296. From July 1, 1894, to November 1, 1894, $2,443,200 were coined. The seigniorage of the same was $786,764.27, making the total amount of silver dollars coined under the Act of July 14, 1890, $38,531,143, and the total seigniorage, $7,766,060.

The total coinage during the year was: Gold, $99,474,912.50; silver dollars, $758,000; subsidiary silver, $6,024,140.30; minor coins, $716,919.26; total, $106,216,730.06. The gold coinage for the year was the largest ever executed at the mints of the United States in any one year.

The highest price of silver during the year was $0.7645 and the lowest $0.5918, showing a fluctuation of $0.1725 per fine ounce. The net gold exports for the fiscal year were $4,172,665, as against $86,897,275 for the prior fiscal year. The net exports of silver for the fiscal year were $31,041,359, as against $7,653,813 for the fiscal year 1893.

The Director estimates the value of the gold used in the industrial arts in the United States during the calendar year 1893 at $12,523,528, and silver at $9,534,277. Of the gold, $8,354,482, and of the silver $6,570,730 was new bullion. The estimated metallic stock of coin and bullion in the United States on July 1, 1894, was: Gold, $627,293,201; silver, $624,347,757; a total of $5,251,840,958.

The production of gold and silver in the United States during the calendar year was: Gold, 1,739,323 fine ounces of the value of $35,955,000; silver, 60,000,000 fine ounces, the commercial value of the same being $46,800,000, and the coining value $77,576,000. Revised estimates of the world's production of metals for the calendar year 1893 shows the same to have been $157,228,100 in gold and $209,165,000 in silver. The world's coinage for the calendar year 1893 is stated to have been $232,485,668 in gold and $135,386,754 in silver.

The Director estimates the stock of gold in the world at the end of 1893 for money purposes to have been $3,965,900,000, and silver, $4,055,700,000; a total metallic stock in the world of $8,021,600,000.

The Banner Mine's Electric Power.

There has recently been installed at the Banner mine near Oroville, Butte Co., Cal., an electric power transmission plant for operating the machinery of the mine and mill. The plant is of 160 H. P., and the power is transmitted two miles from the location of the water power to the mine. In addition to operating the machinery, lights have been installed in the mine, the hoisting works and the mill. The plant has been in operation some months, and that it has been successful is indicated by the following letter from the manager:

OROVILLE, CAL., Oct. 26, 1894.

Thomas Addison, Esq., Manager General Electric Company, San Francisco, Cal.—MY DEAR SIR: I take great pleasure in stating that the electric power plant installed by your company at the Banner mine, for operating the mill, rock breaker, lighting system, air compressor and the pumps on the 300 and 500 levels, works perfectly and to our entire satisfaction.

I take advantage of this opportunity to acknowledge with thanks the constant courtesy, vigilance and ability of your representatives, and to congratulate both you and them on the successful installation of the electric plant in the face of natural obstacles and mechanical difficulties that were seemingly insurmountable. I am very truly yours,

FRANK MCLAUGHLIN, Manager.

HACK FILES of the MINING AND SCIENTIFIC PRESS (unbound) can be had for $3 per volume of six months. Per year (two volumes), $5. Inserted in Dewey's patent binder, 50 cents additional per volume.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 13, 1894.

529,062.—PENHOLDER—E. L. Brown, S. F.
529,247.—BOX-WIRING MACHINE—E. A. Cooley, Cloverdale, Cal.
529,063.—SAW HANDLE—M. M. Cope, Noyo, Cal.
529,257.—CAN LABELING MACHINE—C. R. Fraser, S. F.
528,934.—SLIDING GATE—D. Fulton, Enterprise, Or.
529,328.—TRACE HOOK—J. W. Himes, Chehalis, Or.
529,398.—REVERSING GEAR—J. Hopkirk, S. F.
529,269.—CARRIER—R. D. Hume, Gold Beach, Or.
529,950.—RAILWAY RAIL—A. F. La Shells, Biggs, Cal.
529,282.—PIANOFORTE—F. B. Long, Los Angeles, Cal.
529,147.—GARMENT FASTENER—O. Van Oostrum, Portland, Or.
23,788.—BADGE DESIGN—C. F. Dorrance, Portland, Or.

FOR WEEK ENDING NOV. 20, 1894.

529,586.—NEEDLE THREADER—P. Bralley, Oakland, Cal.
529,361.—THIMBLE—L. A. Buchanan, Stanford University, Cal.
529,551.—STRETCHING BAND SAWS—Hollingsworth & Korbel, S. F.
529,405.—TRACTION ENGINE—B. Jackson, S. F.
529,501.—WHEELED SCRAPER—T. J. Kelly, Los Angeles, Cal.
529,449.—LIGHTING, ETC., STREET LAMPS—C. Keweil, S. F.
529,562.—GARDEN TOOL—C. G. Mortenson, Lorin, Cal.
529,408.—REMOVING LOCOMOTIVE ASHES—A. Reynolds, Seattle, Wash.
529,684.—MEDICATING AIR—R. W. Rogers, S. F.
529,465.—TELEPHONE SYSTEM—J. I. Sabin, S. F.
529,632.—WRENCH—W. N. Smith, Santa Cruz, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

GARDEN IMPLEMENT.—Charles G. Mortensen, Lorin, Cal. No. 529,562. Dated Nov. 20, 1894. The object of this invention is to provide a single implement which is adapted for nearly or quite all the purposes for which it is desirable about gardens and lawns, and an easy means for transforming it into either of its capacities.

It consists of a handle, a flat blade, pointed at one end, pivoted to the handle and turnable about its pivot points to occupy different positions with relation to the handle, a bracing and locking latch whereby the handle and blade are retained in position with relation to each other, a supplemental removable weed pulling attachment, consisting of a bifurcated point adapted to fit the point of the implement having a curved arm extending from its inner edge and latching in a hole in the plate, said arm forming a fulcrum to rest upon the ground when the bifurcated point has been engaged with the root or weed to be extracted. The device may be used in its various capacities as a weed cutter, scuffle hoe or for working in small places in and around flowers.

MACHINE FOR STRETCHING BAND SAWS.—Wm. Hollingsworth and Joseph Korbel, San Francisco. No. 529,551. Dated Nov. 20, 1894. The object of this invention is to provide a device for stretching hand saws as may be needed from time to time. These saws, while at work, are apt to become stretched or elongated, especially upon the front or cutting edge, while the remaining and central portion of the saw, in particular, not being correspondingly stretched, strains come upon it which prevent its working satisfactorily. It is, therefore, necessary to equalize the strains and pressure, which is sometimes done by hammering, sometimes by means of rollers which act to stretch it in lines extending longitudinally of the saw and without reference to the points which may or may not need it. This is apt to cause the saw to buckle or to bulge upon one side or the other. By the present invention the saw is stretched by compression at a great number of points or centers, so that there is practically an outward pressure or tension from all these centers while the intermediate lines of metal remain in a natural condition and act as ties to draw the parts together against outward pressure. The device consists of rollers mounted upon arbors and having alternately crowned and depressed surfaces which meet each other upon opposite sides of the saw blade when the latter is passed between them, and mechanism whereby the rollers are rotated in opposition to each other, with elastic feed disks adapted to grasp and advance the saw.

SEWING MACHINE NEEDLE THREADER.—Patrick Bralley, Oakland, Cal. No. 529,586. Dated Nov. 20, 1894. The object of this invention is to provide a device which is adjustable with relation to the needle and needle bar or hinge so that it may be turned up out of the way when not in use, and readily turned down to clasp the needle, when needed, having a hole through it which exactly coincides with the eye of the needle, and serves as a guide to direct the thread through the eye, the device being made in two separable parts which will open automatically by a little pull to allow the device to be moved away, leaving the needle and thread in position for use.

LIGHTING OR EXTINGUISHING STREET LAMPS.—C. Keweil, San Francisco. No. 529,449. Dated Nov. 20, 1894. This invention is designed to be employed in the lighting and extinguishing of street lamps in a series without the expenditure of time necessary to attend to each lamp separately. It consists of a rod slidable longitudinally through a conduit and connected with a crank arm adjacent to each lamp, said crank arm operating to turn a cock by which the gas is turned to full head when the lamp is fully lighted or turned down so that a very minute flame is left burning. This flame is protected by an enclosing shell so that it is not seen when turned down, and is not easily extinguished by the wind or otherwise.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

Notice of Assessment.

NOTICE OF ASSESSMENT.—OCCIDENTAL CONSOLIDATED Mining Company: location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey Co., Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of November, 1894, an assessment, No. 17, of five cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth day of December, 1894, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the cost of advertising and expenses of sale. By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Notice of Assessment.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of October, 1894, an assessment, No. 1, of 5 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 56, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of December, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 27th day of December, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, 309 Montgomery St., Room 56, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from G. H. Pease and J. B. Colwell in the North River mine, near Yankee Jims, Placer county, Cal., to impound tailings behind dam in Mexican Gulch; and from the Crown Point Mining Co., in their mine in the Tp. of Goodwin, Plumas county, Cal., to impound tailings behind log and brush dam in Porter Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Dec. 17, 1894, at 1:30 P. M.

SITUATION WANTED BY ENGINEER AND machinist who understands the running and care of electric plants. Engagement preferred with parties interested in the use of electricity for the reduction of refractory ores. WM. H. RUE, 242½ 12th St., San Francisco, Cal.

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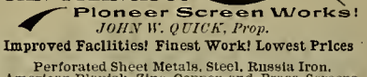

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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 23. SAN FRANCISCO, SATURDAY, DECEMBER 8, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

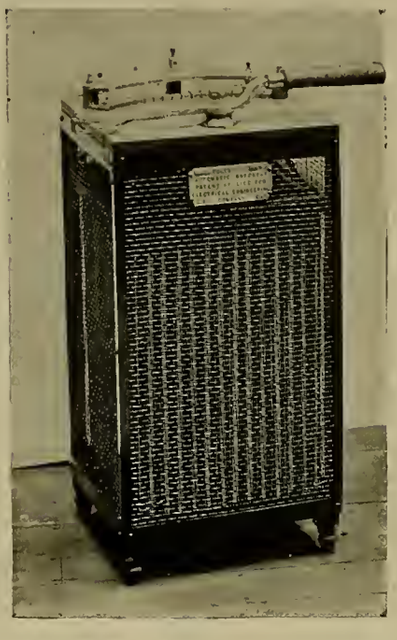
Individual Affidavit Required.

Regarding the attempted issuance of mineral land patents to the railroad, R. M. Veatch, the local land office register, says: "Any person wishing to make an affidavit for protest against the issuance of patent to the Oregon & California R. R. Co. for lands it has applied for, on account of its mineral character, can make the affidavit before any officer qualified to administer oaths; but if the affidavit should be used as a basis for contest, we would suggest that it would be better to have them made before some officer using a seal. We have no form of affidavit, but it simply should contain all the facts as to the mineral character of the land, and the possession, location, expenditures, etc., if any, and asking that a hearing may be ordered to determine the mineral character of the land, etc."

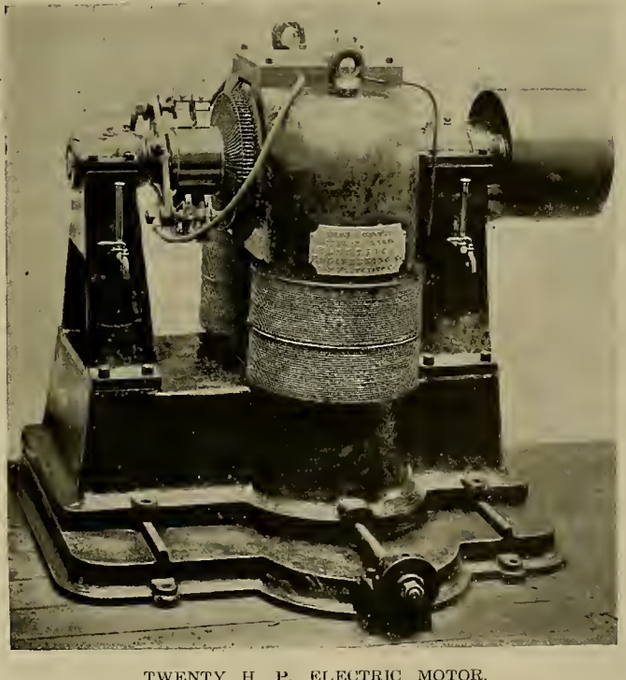
Local Electrical Manufactures.

The lower cut represents one of a series of 20 H. P. electric motors recently manufactured and installed by the Electrical Engineering Co. of 34 and 36 Main St., San Francisco, in Sierra county for mining purposes. Mr. C. B. Sessions, the manager of the company, reports entire satisfaction expressed by the users of those motors.

The other cut represents the Electrical Engineering Company's series non-arcing rheostat for electrical mining hoists. The apparatus is so constructed that the motor is always protected, and at no time permits a greater flow of current to the motor than it is made to safely carry.



RHEOSTAT FOR ELECTRICAL MINE HOIST.



TWENTY H. P. ELECTRIC MOTOR.

A MONAZITE "boom" is reported in North Carolina. It is a rare mineral found in exceedingly small quantities in Finland, Bohemia and Cornwall, with the quality of being apparently indestructible, becoming incandescent when heated to the utmost limit, eagerly sought after by illuminating companies. Grains of brown crystalline sand found in the Appalachian range have been pronounced by experts to be this lonely mineral, and research has uncovered alleged tons of it. At present it is worth $200 a ton, and is being shipped to Germany. North Carolina also reports the finding there of an emerald mine, near Bakersville, Michell Co., from which are now being extracted gems of great value.

ABOUT two months ago J. S. Cahoon of Salt Lake went to the Snake river placers in Idaho with a view of examining the black sand deposits near Almo. He writes that for the first four days he used a pan to find the worth of the placers. The gold was the usual flour gold of that region—difficult gold to save—but he says the four days' service with the pan yielded $27, and that one piece of coarse gold was found in the pan. It weighed thirteen pennyweights, and is estimated to contain $10 in gold.

THE California State Miners' Association has had Mr. Rickett's paper on "Department Rulings and the Miners" published in pamphlet form, and 2000 copies distributed. It was read at the recent Miners' Convention, and attracted considerable attention.

MICHAEL SHUMAN, a well-known mining man, has returned to Spokane, Wash., from his mines in the Okanogan district, and reports the find of a bonanza gold mine at the summit of the Cascade range of mountains, near Slate creek. Two men from Anacortes, named Gerrish and Baron, the finders, are reported by Shuman, after a week's work with the crudest of implements, to have cleaned up $12,000, with plenty more of the same in sight.

BUT three weeks remain for owners of mining claims to file for record notice of intention to hold and work the claim on which no assessment work has been done this year. The provisions of the Act amending Section 2324 of the U. S. Revised Statutes, exempting miners from doing the annual $100 worth of work on the claims, requires that notice of intention to hold and work the claim shall be filed before Jan. 1st, '95.

IN accordance with resolutions passed at the recent Miners' Convention, President J. H. Neff has appointed a committee for the protection of mineral lands from railroad grants, composed of A. H. Ricketts of Alameda, Charles G. Yale of San Francisco, Charles F. Hoffman of Placer, E. C. Loftus of Tuolumne, and J. M. Wright of Alameda. It is the duty of the committee to appear before the Department of the Interior by memorial and by agent, to endeavor to stop the patenting of mineral lands to the subsidized railroads; also, to obtain an order from the Commissioner of the General Land Office that the burden of proof that land claimed as agricultural by the railroads shall be placed on those corporations in accordance with the decision of Justice Field in the Bardon case. Another committee was appointed to consider the establishment of a mining exchange in San Francisco. The committee consists of J. M. Fulweiler of Placer, W. F. Englebright of Nevada, Thomas T. Lane of Calaveras, C. C. Bush of Shasta and L. F. Reichling of Amador.

ON another page appears No. 2 of the "Notes on the Gold-Bearing Black Sands of California," by Mr. J. A. Edman. So much present inquiry is received regarding these sands, their source, probable profit and method of treatment that these papers possess more than ordinary interest, and are a valuable addition to the stock of information regarding this important subject. Mr. Edman, who is a practical man, has given this matter considerable intelligent study, and the result of his present series on gold-bearing sands must be of benefit to all who are in any way interested in this important source of natural wealth.

CONGRESS met for the short term last Monday. As the members elected on the 6th ult. will not take their seats till the 4th of March, '95, it is not probable that the silver question will receive much attention during the present short session. Consideration of that issue will probably be reserved for the long session, making it a question, as it is sure to be, in the presidential campaign of 1896.

BLACK SAND MINING is receiving considerable attention in Del Norte Co. Letters are received from all sections inquiring about the prospect of mining our beaches, the writers having machines they are certain will save the gold.

THE African Gold Recovery Co., which recently announced a reduction of the royalty on their cyanide process, states that during October they had recovered 56,000 ounces of gold at the Randt, and 8700 ounces in other districts, a total of 64,700 ounces. The September total was 62,100 ounces.

THE National Electric Light Association's next convention will be in Cleveland, first week in March '95.

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Entered at the S. F. Postoffice as second-class mail matter.

J. F. HALLORAN.....General Manager

San Francisco, December 8, 1894.

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ONE would think, says the Placer *Republican*, that the city of Sacramento would be anxious for the revival of the mining industry of the State, inasmuch as that city is the natural depot of supplies for the mining regions. The miners only ask to be enabled to work their mines after the Government has built such dams as will protect the valleys from injury, and yet we see an organization, styling itself the Anti-Debris Association, meeting in that city and solemnly protesting against the resumption of hydraulic mining under any conditions. We don't believe the association referred to represents the real sentiment of the people of Sacramento upon the subject.

WHILE a decision of the Supreme Court of the United States must always be given respect, and nearly always approval, yet a recent decision by that tribunal does not seem imbued with its usual spirit of equity. It is in effect that any inventor or owner of patent whose invention may be used by the United States Government, without agreement or contract, has no claim against the Government. The case in question involved a claim of $60,000 sued for by reason of the use by a government architect of a patented pavement in the grounds of the National Capitol. If that decision is run out to its logical conclusion, any patent device submitted to government officials can be adopted and used by the Government without any profit to the inventor, even were he in possession of a patent from the Government itself.

IN an address before the Academy of Sciences last Monday night, Mr. Irving M. Scott of the Union Iron Works made timely and appropriate reference to the continued loss this State entails upon itself by hiring other communities to do the work that could and should be done within the borders of the commonwealth of California. He showed that we annually pay nearly $2,000,000 for cars and locomotives, which mainly goes elsewhere—and, incidentally, pay nearly as much more in charity to deserving men who have no work. Other millions in other lines are sent away to the great detriment of the State, thus drained of coin for things that, under better industrial conditions, could be made here. Mr. Scott has earned the right to speak plainly of these things. By the untiring energy of himself and associates, he has shown what California can do in securing contracts for and turning out battle ships, and in this has but given index to what is possible of achievement in the line of manufacturing enterprise in this State and city.

The Debris Commission.

At this week's meeting of the Cal. Debris Commission no permits were issued. It is thought that action will be taken next week on the petition of the Gold Run Hydraulic Mining Co. for permission to construct a rock dam in the North Fork of the American river.

Col. Meudell, Col. W. H. H. Benyaurd, Major Heuer and Lieut. C. E. Gillette, the members of the Commission, have made their second annual report to the Secretary of War, covering the past year's operations and outlining what has been done.

Application was made last April by the Commission for interpretation of the law's intent as to hydraulicking going on without permits. Att'y Gen'l Olney then gave it as his opinion that, waiving the question of the Commission's duty to order the discontinuance of such operations, they were empowered so to do, advising that previous notice be served on the parties violating the statute. Accordingly the owners of eight hydraulic claims were so notified, all promptly ceasing and making applications for permits. Two-thirds of 78 applications made during the year were granted.

For the twelve months ending Sept. 30, '94, the amount of material mined is estimated at 1,500,000 cubic yards; the present available storage provided is estimated at 8,500,000 cubic yards. The report refers to the conditions requisite in the construction of dams to be accepted by the Commission.

Among the requirements as to the storage of detritus are mentioned the character of material, size of mine, its distance from navigable waters, output of other mines in the same drainage basin, quantity of water flowing in that basin and other physical features. If the basin is an old hydraulic bed into which the flow of water is at all times small, any type of dam, while mining is carried on, will be considered efficient. In all other character of mines dams of a more permanent nature are required. A brush or timber dam is not considered permanent except where so situated as to be always kept wet. Such dams have generally been approved for small mines.

Monthly reports are required of each miner holding a permit, and mines are inspected by an executive officer. The inspection and reports relate to effectiveness of the restraining of detritus and include observations of the quantity of soluble material that escapes to water courses. This refers to clays or sand in minute grains. Such material can be stored only in cases where a period of rest can be secured behind barriers.

The report enters at length into a statement of existing conditions, as found by careful observation, and the aims and needs of the commission. The Yuba and Bear rivers are cited as being most seriously affected by the detritus. The report says that the mass of material in the lower end of the Yuba is so great that the present river bed is several feet above the surrounding country. It is confined by levees placed about two miles apart. The mass of detritus at its mouth forms a kind of submerged dam at the mouth of the Feather river, so that at each high water the city of Marysville is seriously threatened with great danger. The navigability of the Feather below the mouth of the Yuba is much impaired by this filling. Conditions similar to the Yuba obtain to a less degree in the Bear. Under these conditions a more thorough impounding of detritus is required for mines draining into these rivers.

Not as much as was desired has been done toward improvement of navigability of rivers, owing to lack of funds. The sum of $20,000 is estimated to be required for surveys that the Commission proposes to further make with a view to the improvement of the rivers. A survey of the Sacramento and Feather rivers is now being made. In Suisun bay it is estimated that, between 1850 and 1878, 407,000,000 cubic yards of detritus were deposited, and about 10,000,000 cubic yards annually from 1878 to 1885 It is estimated that the raise of the river bottom at Sacramento since 1850 has been at least fifteen feet, not less than that at Marysville, and that there must be at least 120,000,000 yards now in the Sacramento and Feather rivers below Marysville. In the opinion of the Commission, these figures indicate that the possibility of filling up Suisun bay and consequent removal of the mouth of the Sacramento and San Joaquin rivers from near Collinsville to near Benicia is a question that must be given serious attention before a definite plan for the cleaning out of the rivers can be formulated. A restraining barrier is reported to be needed in the Yuba at De Guerre Point to retain above it the mass of stone, gravel and sand which is moving down the stream, and which, to a large extent, each year reaches navigable waters. The Yuba river, beginning at De Guerre Point, should be trained and controlled in one channel by the protection of its banks mainly by brush work. The intent of the operations on the Yuba river is to effect control of the river and raise the banks to a height at which willows will grow, they protecting the banks of the river. When this result shall have been secured, large deposits of detritus lying below De Guerre Point, estimated to contain several hundred millions of cubic yards, may be regarded as impounded.

When these operations shall have been carried out, the degree of impounding that is practicable will have been secured and the contribution of detritus to navigable channels will be reduced to a minimum. In the process reached by this method the bed of the river is scoured and the material carried below, and becomes year by year less a danger. The quantity of material brought down by the Yuba cannot now be estimated.

The Commission is of the opinion that the amount of detritus now in the Yuba river from De Guerre point to Marysville is 308,000,000 cubic yards. A rough estimate of the quantity of this material between Smartsville and De Guerre point is made at 100,000,000 cubic yards, making a total of 408,000,000 cubic yards now in that river as the result of the mining of 176,000,000 cubic yards.

During the current year the Commission expects to recommend an appropriation for the restraining of detritus lying in the Bear and American rivers.

The report is a complete and impartial statement of fact, and of great interest to the dwellers in the valleys and foothills alike.

The Wardner Trouble.

The latest phase of the disquietude in Idaho mines is the strike at and consequent shutting down of the Bunker Hill and Sullivan mine, which for the past year has employed about 350 men. The closing down was under the following instructions from this city:

H. W. Bradley, Wardner, Idaho: Owing to the steady decline for months past in the price of silver and lead, giving this company a very small profit at the cost of the rapid exhaustion of its mines, the company has contemplated for some time past the closing of its works, but has hesitated taking such action, hoping for improved prices and disliking to discharge its employes at the beginning of winter. Now that there is no prospect of improved prices and the company is relieved of all responsibility by the action of the miners' union making such demands that to accede thereto would be virtually surrendering the management of its affairs to that association, you are directed to pay off all employes and close operations. N. H. HARRIS, President.

The monthly pay roll was $38,000; of this $30,000 went to underground men. The cessation of all work is a blow to Wardner, which was just getting over the effects of the last big strike.

The miners' union claims that their members were blacklisted, and that Italians, Finlanders and other "outside" men were employed in preference to heads of families resident in Wardner. They demanded: Recognition of the miners' union; that all underground men join the union at once; that some of the men now employed by the company be removed; that there be no discrimination against the men now in the community; that no more men be imported, and that the men now in Wardner be given the preference.

The question of wages does not seem to have entered into the controversy.

WITH few exceptions, the press of the State and coast upholds and endorses the action and sentiments of the recent California Miners' Convention. A few of the valley papers which are in constant opposition to the efforts of the many to promote the general prosperity of the State argue against the proposed aid to build restraining dams, but the great heart of the public beats in sympathy with any and all effort to produce greater yield of that which benefits all alike, when, too, the effort is with careful regard to the rights of all.

WITH this issue is resumed publication of Prof. Hanks' elaborate treatise on Mineral Hydrocarbons.

Concentrates.

THERE are 65 men working at the Pilot Bay, B. C., smelter.

ABOUT ninety men are working the Thistle shaft near Gibsonville, Sierra Co.

W. S. STRATTON'S income from his Cripple Creek mines is estimated at $20,000 a day.

THE Erie, Iowa and Birchville mines, Eureka district, Nevada Co., have started up again.

THE Halsted mine at Spanish Ranch, Plumas Co., is being put in shape for extensive operations.

THE Horsefly hydraulic mine at Cariboo, B. C., is said to show a yield of $13,000 for two weeks' work.

THE Anaconda this year promises to beat its record of 1892, when it produced 100,000,000 pounds of copper.

AINSWORTH, WASH., claims to have enough ore in sight to furnish sufficient ore to run the biggest kind of a smelting plant.

ALL the machinery has been taken out of the underground workings of the Yuba mine at Maybert, Nevada Co.

IT is understood that the Lane-Haywood-Campbell purchases in Silver Bow Basin, Alaska, involve the payment of $500,000.

THE Columbia G. & S. M. Co. at Scott's Bar, has bought the five-stamp mill that was in operation at the California Midwinter Fair.

THE Government has built eight wing dams, at an expense of $15,000, in the Sacramento river, above Freeport, to scour out a channel.

THE Union Mining Co. has bonded the Keystone and Pittsburg mines on North Powder river, eastern Oregon, and is developing them.

J. F. WARDNER has succeeded in interesting Philadelphia capitalists in operating a group of gold-bearing mines near Kennedy, Nev.

ON the co-operative plan at the Morning mine, near Mullan, Idaho, during October the miners thus employed are said to have made $2.68 per day.

AFTER lying idle for about seventeen years, the old Murchie mill, near Nevada City, is being fitted up, and will crush the ore of the Lone Star Co.

THE Helena, Montana, assay office has shipped an average of $250,000 in gold a month for the past five months, an increase of 50 per cent over last year.

THE Columbian mine in the Virtue district, Eastern Oregon, is now declared to show a five-foot ledge, the ore clear across the vein going $200 to the ton.

TO THE Silverton, Col., *Standard* the principal effect of the past election appears to be that mining stocks are going up and miners' wages going down.

THE chlorination furnace for the Jackson-Lakeview mine, Mono Co., is in place, and the rest of the plant will be ready for work by the first of the year.

THAT is a costly shaft now being sunk at the Argonaut mine in Amador Co., the expense being $80 per foot. Ordinarily, it averages from $25 to $30.

CONSIDERABLE work is being done in the six properties in the Rice district, the new gold field at the edge of the desert, east of Warner's ranch, San Diego Co.

THE cinnabar ledge near Tuscarora, Nev., still attracts considerable attention, and were quicksilver worth anything like the prices of former years, would be developed.

THE Syndicate Mining & Smelting Company, J. H. Whalon, president, has incorporated with $100,000 capital stock, to develop its gold properties at Camp Floyd, Utah.

THE headquarters of the State Miners' Association have been removed from the Mills building to the fourth floor of the Stock Exchange building on Pine street, this city.

THE Ashland, Or., Mining Co. is reported in financial trouble. Several of the employes have filed liens. The ledge is rich, but expensive work has made the company short of cash.

FOUR quartz mills are now at work at the junction of Applegate and Williams creek, Oregon. Each with an adjacent mine furnishes employment for from ten to twenty-five men.

THE South Eureka shaft is to be sunk 300 feet deeper, when it is expected developments will justify the erection of a mill. The company has already spent nearly $100,000 developing the property.

THE new compressor of the Centennial-Eureka Mining Co. at Tintic, Utah, will be in running order by the end of this month. Another double dividend of $30,000 has been paid, being $1 per share.

AT Tintic, Utah, the Mammoth mill is working thirty stamps and putting in twenty more. The company will do away with leasing at the mine, and put seventy-five men to work at day's pay.

MANY of the mines of Butte, Montana, are lighted by electricity. In the larger properties independent plants are in operation, while in the smaller ones the current is obtained from the local station.

THE new quicksilver furnace of the Altoona Company at Cinnabar, Shasta Co., has started. The average of the ore is over five per cent in quicksilver. Two other furnaces are to be added in the spring.

THE Hibernia quartz mine at Greenville, Plumas Co., has been bought by Gullic & Co., who are about to put a twenty-stamp mill thereon. They have also secured twelve other locations in that vicinity.

THE property of the Rainbow Mining Company, Nevada Co., has been attached. The men at work say they were unable to get wages due them. The mine is owned in this city. About $5000 is claimed to be due.

THE Wimer claim, near Waldo, Or., includes 230 acres, with 2100 inches of water and 175 feet pressure. It is thought that it will take a century to work all the ground controlled by one of the two cuts in this district.

IMPROVED MACHINERY is to be put on the Bogan silver mine, an extension of the famous Silver King, at Park City, Utah, consisting of an improved thirty-five-horse power double cylinder reversible engine and a 1200-foot cable.

E. J. RADDATZ AND F. DUROY of Mercur, Utah, have bonded their Bonanza group of mines of thirteen claims to Bigdon & Smyth of Colorado, for two years. The purchase price is $100,000. The group is 1¼ miles east of the famous Mercur.

IN Shasta county 120 stamps are reported dropping—30 at Squaw Creek, 20 at the Texas, 10 at Quartz Hill, 20 at Iron Mountain, 10 at the Washington, 5 at the Myers, 10 at the Wheeler, 10 at the Minnesota and 5 more at the Gulch.

THE Black Gold Channel Mining Co., composed of M. Phelps, J. M. Sparkham, M. P. Ward, J. H. Shotwell, Chas. Twombley and S. McLean, all of Seattle, Wash., has paid $16,000 for placer mining property on Foots creek, Josephine Co., Or., and will develop it.

THE California mine, five miles from Hornbrook, Shasta Co., has been bought by four men from Mercur, Utah—Dern, Arris, Brown & Helmrich. It is the freest of gold ore, dissolving in water, and the new purchasers estimate they have half a million in sight.

THE Pichacho placer mines near Yuma have shut down. After a week's run with twenty-three men they cleaned up $30 in gold. Expert Glendenin, who is examining the pumping plant, says the pumps must be moved and changed before they can do good work.

RECENT extended mention was recently made of the "Culoric process" for treating tellurium and pyrites. Major Cooper of Durango, Col., asserts from trial that it is a success, and that at the Philadelphia plant the entire cost of treatment does not exceed $1.20 per ton.

THE Phœnix Reduction Company has rebuilt the Bullionville, Nevada, mill, burned last year, and is about to commence operations, using the cyanide process. The tailings of the old mill will be put through first. This will be the first cyanide mill in southeastern Nevada.

THE Anita G. M. Co. has incorporated with $10,000,000 capital, to work the Bright claim on Shober Hill, Amador Co. The incorporators are: F. Reichling of Oakland, D. E. Hays of Mill Valley, John Barton of Alameda, George Goodman of Oakland and W. E. Davis of San Francisco.

THREE new converters of five tons capacity each, for the expulsion of sulphur from copper ores, are on trial at the Copper Queen Company's works in Bisbee, Arizona. From each charge of molten matter—five tons—there are usually fifteen bars of fine copper weighing 350 pounds each.

THE demands of the Bunker Hill and Sullivan miners at Wardner, Idaho, are that union men be hired and no discrimination in employment of capable miners, those now there to have the preference, and no men to be "imported." Everything has shut down and resumption is indefinite.

IT is rumored in Deadwood, South Dakota, that J. B. Haggin of California, the Swifts of Delaware and the Omaha & Grant Smelting Company have combined and will erect large smelting works at Deadwood, at which place all the ore from the tributary country can be treated at the least cost.

THE *Independent* reports that A. W. Drummond found a nugget of pure gold weighing three pounds last week in Slate gulch, near Big Oak Flat. He dug it out of gravel. There was no quartz attached to it. A piece of nine pounds weight was taken out of the same gulch about thirty-five years ago.

IN the town of Forty Mile Creek, on the Yukon river, Alaska, the largest in the placer gold mining district, flour sells for seventeen cents a pound, bacon brings forty cents, beans are firm at twenty cents, butter is strong at seventy-five cents and dried fruit is worth twenty-five cents a pound.

THE Idaho Gold Mining Co. has incorporated with $150,000 capital at Salt Lake. The president of the company is Ezra Thompson; William A. Wilson is treasurer, and Charles Mador, secretary. The intent is to work the Robinson and Austin mines in Mt. Pisgah mining district, Bingham Co., Idaho.

ACCORDING to reports from the Silver Coppolis mine, fifteen miles from Baker City, Or., there is an unlimited vein of copper ore from six to twenty-five feet, the rock running 20 per cent in copper. The owners, J. C. Taylor and L. W. Clark, expect to get a rate of $6 a ton to the sea, and figure that they have a bonanza.

C. H. HENY, superintendent of the Nevada Southern Railway, and associates have eleven claims at Goldstone, the new camp twenty miles north of Fenner, on the Atlantic & Pacific railway in San Bernardino Co., for which he says they have refused an offer of $60,000 in three equal payments by San Francisco men.

FOR two years the North Fork Company has been putting in 1,000 feet of flume at its mines in Siskiyou county, hydraulicking for bed rock, and now has struck pay dirt which, it is said, goes a dollar to the pan. Nothing can be done this winter, but the owners figure on taking out a thousand dollars a day next spring.

THE mill in Collierville, Calaveras Co., is not running. The proprietors assert that it is a waste of time and precious metal to try and save the gold by mill process. The ore is very refractory. Quartz that yields $35 per ton by mill process, gives returns of $325 per ton at Selby's smelting works in this city. The expense of shipping quartz from the mine here is $35 per ton.

THE announcement that a Boston syndicate was about to open up thirteen large mines at Coulterville, Mariposa county, has caused men to go there in search of work, and they are now lying around the town in idleness, as the mines are not yet in operation and will not be until next spring. It is a good plan for miners and other laboring men not to go to the town, so advises the Stockton *Independent*.

THE annual report of Governor Hughes of Arizona shows for the year an increase of silver product to the amount of $702,000. The increase in gold is $1,078,000 and of copper 9,557,993 pounds. Arizona now ranks third among the States and Territories in copper production, fifth in gold and seventh in silver. The current monthly output of gold indicates that the total product for 1894 will be over $4,000,000.

RETURNED miners from the Western Australia gold fields say Coolgardie, which is 400 miles east of Perth, is reached by mule teams or camels. It contains 6000 people. The water used for drinking and cooking purposes is distilled salt water from salt wells, and is sold for twenty-five cents a gallon. Flour sells for $7.50 a bag, or $15 per 100 pounds. Canned meat is retailed for 65 cents a pound. The surrounding desert is rich in gold, but without water to wash it out of the sand men are working at a great disadvantage. All that a man can do is to pick small pieces of gold out of the earth. He occasionally finds pieces of gold the size of a pea, and once in a while small nuggets of greater size. It is hard work and does not pay. A California dry washer would be a Godsend to many a poor fellow there.

LETTERS in Eastern papers declare that "there is a great gold excitement in the Argentine Republic, and thousands of prospectors are rushing into the Chubut Territory, where, in the opinion of an expert California miner who has explored its mountains and valleys, are the richest gold veins in the world, and more of the yellow metal in sight than the capital and deposits of the Bank of England could pay for. The discoveries are in the foothills of the Andes, near the source of the Rio Negro."

THE Gold Bank, at Forbestown, has increased the capacity of the mill by adding to the weight of the stamps. Of the forty stamps, twenty-five have had their stems lengthened, thereby increasing their weight 400 pounds to the stamp. The other fifteen stamps will be served in a like manner within the next two or three weeks. By this change in the weight of stamps the crushing capacity of the mill is increased about one-fifth, and will work in the neighborhood of 120 tons per day.

THE new leaching plant for the Bimetallic G. & S. M. Co., at Phillipsburg, Montana, can handle 700 tons of roasted tailings or 300 tons of dried tailings every twenty-four hours. The mill was originally a 100-stamp mill, but only the new addition is being used, as no ore is being mined, the property having been closed down last fall on account of the low price of silver. At the Bimetallic mill there are 160,000 tons of tailings, from which the Russell process extracts 75,000 ounces of silver and $3000 in gold per month.

THE United States Supreme Court has issued a writ of certiorari in the case of the Tyler Mining Company against the Last Chance Mining Company of Idaho. This is a point in favor of the latter. The Circuit Court of Appeals in this city decided the suit in favor of the Tyler Company. The writ issued by the Supreme Court lends to a possible reopening of the case. Both mines are situated near Wardner, Idaho, and their value is said to be upward of $2,000,000. The litigation grew out of a conflict of location, one mine lapping the other.

THE Poorman mine is said to have the finest all-round plant in the Cœur d'Alenes. It employs about 200 men in all, and the concentrator handles an avarage of 350 tons every 24 hours. A shaft has been sunk 900 feet. It has great electric pumps on the 600-foot level, and a large compressor for working the air drills. About 400 electrical horse power has been generated from water. The mine is worked in stopes and the upper levels are filled with the refuse of the new work below. The Poorman ships from 1500 to 1800 tons of concentrates each month.

SINCE Sept. 1st, twenty-two buildings, including a twenty-stamp mill, have been built at the English Mountain mine, near Grenitevillo, Nevada Co. About fifty tons of free-milling ore are daily crushed. The ore is carried from the mine by a wire cable, three-fourths of a mile. Buckets are placed upon the cable seventy feet apart, each one holding about 100 pounds of ore, and the mine being about 800 feet higher than the mill, the weight of the full buckets requires a brake to keep them from running too fast. They are partly loaded and wholly emptied automatically.

THE Tolo placer and quartz mining property, near Fort Lane, Oregon, has been sold to Tacoma men for $6000. The mine embraces 160 acres and has been profitably worked by crude methods for the past twenty years. The new company have bought a 150-horse power engine and the other necessary machinery. The water will be pumped from Rogue river and the pressure will be through the force of the engine. They claim that they can force through the pipe 2000 gallons per minute. The cost of the machinery is $7500. It will be placed and ready for operation by January 1.

THE iron mines of Hanover, N. M., are being worked to a higher production than ever before. There has always been vast quantities of the iron ready for extraction, but the demand has never been equal to the supply, nor is it now, as the mines could readily turn out thousands of tons of ore per day. But the demand has increased so that from 150 to 250 tons of iron ore is being shipped daily. Fifty men are employed at the mines breaking the ore, besides the teamsters employed in hauling. The camp is a thriving one, and with increased demand for iron and copper will soon grow to be one of the largest mining camps in the west.

TALKING about the gold output, the Victor, Colorado, *Gold Record* says: "The latest estimate of the production of the district is fixed at forty-six carloads, or 690 tons daily. Placing the value of the ore at $50 per ton, which is a low average estimate, it makes a daily output of $34,500 per day, or $1,035,000 per month; and this without counting the retorts from the stamp mills in the district or from the cyanide and chlorination plants now in operation. It looks as if the district had passed the one-million-dollar mark, and a noticeable increase can be looked for as soon as the low-grade ore commences to move toward the enormous mills being erected at Florence. The regular shippers are the Victor Public Sampling Works, Independence, White House, Strong, Bobtail, Victor, Portland, Caledonia, Dolly Varden, Anaconda, Moose, Raven, Gregory and Elkton. The total product for 1894 will be over $12,000,000."

Personal.

J. B. WHITE has been appointed chief engineer at the W. Y. O. D. mine.

J. G. Bloomer is now with the electrical firm of Holtz & Fey, 39 Stevenson street.

GEO. NIHEL of Nevada City succeeds W. A. Hawley as superintendent of the Brunswick mine, near Grass Valley.

ENSIGN G. H. BURRAGE, U. S. N., has been ordered to the Union Iron Works, as assistant to the Inspector of Electric Lighting.

CAPT. PALMER is announced as the new superintendent of the Boston and Montana Mining Co., to take charge when Capt. Thos. Couch resigns to devote his exclusive attention to the development of the Merced Gold Mining Co.

Notes on the Gold-Bearing Black Sands of California.

NUMBER II.

Written for the MINING AND SCIENTIFIC PRESS by J. A. Edman.

In contradistinction to the heach sands, which represent Nature's concentration on a grand scalc, the stream sands seldom became noted except through man's operations as a gold miner in placer and other gravel deposits, and they have, with few exceptions, generally been regarded as waste products.

Being originally but a small portion of the enormous mountain masses removed by subaerial erosiou and degradation during later geological periods, where the ancient deep gravel deposits were formed and succeeded by those of the present river systems of the Pacific coast, the black sands of California represent the minute forms of the minerals which have hest resisted the action of physical forces, tending to the disruptiou, abrasion and solution of the rocks exposed to their action. By virtue of their density associated with the gold and the platinum metals set free from their matrices by the same agencies, they may justly be said to be hoth gold-hearers and gold-carriers of California's placer mines. First noted as an impediment in the miner's rocker in the early days of river mining, the stream sauds have since then appeared in varying quantities wherever placer mining was prosecuted—in river hars and beds, in creeks, ravines and gulches, in the drift mines of recent and ancient channels, and in the stupendous operations of hydraulic mining. In fact, wherever placer mining became an industry, both in ancient and modern times, the heavy sands were noted, but chiefly for the precious stones they carried, such as the diamond, the ruby, the sapphire and the topaz.

The origin of the stream sands may he traced hoth to the metamorphic and archean crystalline rocks ahounding in California, of which many of its minerals form primary components, and also to the eruptive and volcanic rocks, where they generally occur as secondary products. Even in the tufas and volcanic pipe clays of California many of the most ahundant minerals of the stream sands, such as magnetite, ilmenite and chromite, may he found in abundance and uearly always as alteration products. The zircons are supplied by the granites and syenites, while the garnets are derived from the mica schists, not very prominent in California hut well represented iu British Columbia.

For convenience in description the stream sands will he classified as *original* when obtained from one distinct gravel channel or stream bed, and as *mixed* when collected from miniug debris, such as tailings mingling from different gravel mines as well as from quartz mines. As a rule the greatest variety of minerals is found in the sands obtained from the oldest channels, whose material is chiefly derived from the metamorphic slates and oldest crystalline rocks, where also generally the greatest gold contents are found. The quantity of hlack sands is often determined hy local conditions of gravel deposit, and is not in direct ratio to gold coutents, which is strikingly illustrated in the stream sands from the lava channels, which in character differ much from the above mentioned, being rougher and less worn, often with foreign material adhering to the grains and frequently oxidized and brown in color. The richness of any particular sample of stream sand, when reduced to the proper staudard, is generally determined hy the amount of erosion of the stream where found, the small and shallow ravines furnishing the poorest. With the almost universal distribution of magnetite and titauiferous irou through the gold-bearing rocks of California and the frequency of veins of iron ores, such as hematite and magnetic iron, it can readily be perceived that large quantities of these minerals may be set free even by the ordinary weathering of the rocks at the surface, without heing associated with gold in appreciahle quantities. Many of the dykes of eruptive rocks met with in the gold regions carry, particularly near their walls, much finely disseminated magnetite, practically unaccompanied hy gold. The stream sands may therefore he said to be indicators of gold and not necessarily gold hearers except in instances to he hereafter mentioned, and the greater the variety of their special minerals the hetter the prospect of economic value.

To the geologist and litholgist the study of these sands offers opportunities not to he neglected. Each distinct stream, hoth ancient and recent, carries in its heavy minerals testimony of the rocks through which its channel was cut, and its length and size may often he surmised from the physical coudition of the minute grains of its black sands. The variety and beauty of its microscopic minerals, presenting often sharp, distinct and perfect crystals of varied forms and colors, will interest the general observer, and serve as studies for the petrologist, fully as important and often more satisfactory than rock sections. Taken in conjunction with the heavier gravel, the intelligent miner will find in these sands the means of determining with accuracy the continuity of each distinct channel and trace the entrance of branches into the main streams. Even the proximity of important metal-bearing veins are indicated under the microscope by the presence of minerals peculiar to certain classes of ores, and the presence of one large lode will often he found to influence the character of the stream sands for a mile or more helow its intersection hy the stream.

CHARACTER OF STREAM SANDS.

In addition to the six minerals mentioned in the first paper of this series as composing the hulk of the beach sands, the followiug enter largely in the compositiou of our stream sands:

*GROUP 1.—ABUNDANT MINERALS.	Specific gravity.	Hardness.
Iron pyrites	4.0 —5.2	6 —6.5
Marcasite	4.8	6 —6.5
Limonite	3.6 —4.0	5 —5.5
Psilomelane	3.7 —4.7	5 —6
Cassiterite (tin ore)	6.84	6 —7
Garnet	3.15—4.3	7 —7.5
Olivine	3.5	6 —7
Zoisite	3.35	6 —6.5
Epidote	3.4	6.7
Bronzite	3.2	5.5
Titanite	3.6	5 —5.5
Hornblende	3.2	5 —6
GROUP 2.—OCCASIONAL MINERALS.		
Diamond		10
Corundum		9
Topaz		8
Spinel	3.6	8
Beryl	2.7	7.5—8
Tourmaline	2.9 —3.3	6.5—7.5
Tantalite	7 —8	6 —6.5
Rutile	4 2	6.5
GROUP 3.—ADDITIONAL MINERALS OF THE MIXED STREAM SANDS.		
Gold-bearing quartz	2.6 —19	.....
Mercury	13.56	.....
Arsenical pyrites	6 — 6.4	.....
Copper pyrites	4.1 — 4.3	.....
Zincblende	3.9 — 4.2	.....
Galena	7.2 — 7.7	.....
Wulfenite	6 — 7	.....
GROUP 4.—METALS AND ALLOYS OF THE STREAM SANDS.		
Gold	15.6 —19.5	.....
Gold amalgam	15 —18	.....
Platinum	16 —19	.....
†Nickel-Platinum	14.6 —16	.....
Iridosmium	19.3 —21.1	.....
Nickel-Iron	7.5 — 8.5	.....
Copper	8.8	.....

*Specific gravities and hardness are mainly from Dana's System of Mineralogy and Rosenbusch's Physiography of the Rock-making Minerals.

†Noted and described by Melville Atwood of San Francisco.

It should be noted that the ahove mentioned minerals exceed 3.00 in specific gravity, and go ahove 5.00 in the scale of hardness. The silicates, oxides, etc., of the first and second groups are chiefly interesting to the minerallurgist, while groups three and four comprise most of the economically valuahle minerals. Cassiterite, in the form of stream tin and wood tin, was noted years ago in the gold mines of Australia, and is now an important element in the miues of Queensland. It is found in many of the channels of California, and occasionally in quantity. Nickel-iron is seldom seen in California, but is abundant on the lower Fraser river in British Columbia. All of the minerals of the third group are derived from the tailings of gravel mines and quartz mills. The gold amalgam comes from the same source, and has originated from a chemical comhination between gold and mercury when long in contact. It is generally found crystalline.

The original stream sands of California, obtained in placer mining, were for years entirely neglected and thrown aside as worthless, until some twenty years ago a few of the drift miners, noticing the quantity of rusty or coated gold carried by them, proceeded to treat them by very simple methods, chiefly by crushing aud grinding in large mortars. The result was geuerally quite satisfactory, and many thousands of dollars were thus saved. Later, some of the large hydraulic mines treated a portiou of their black sands, and always with profit. Instances of such treatment occurred at the Bald Mountain drift mine of Sierra county, and at the noted Smartsville hydraulic mines of Yuha county. Still no systematic method of working all the hlack sand was adopted, and no effort whatever was made to concentrate these sands from the tailings and thus obtain the gold lost in mining operations. Meanwhile the enormous masses of debris deposited chiefly from the hydraulic mines in many of the rivers of California and their branches—notably in the Yuba, Americau and Bear rivers—led to the agitation which resulted in the cessation of hydraulic mining. During the period the Debris law has heen in effect heneficent Nature has intervened to remedy the apparent waste and destruction. The waters of the Sierra Nevada, now free from their constant hurdens of sand and sediment from human operations, have gradually but silently been sorting, grading, moving and concentrating the waste sands, and new deposits are forming hy the constant reduction of the tailings in hundreds of the streams in this State, containing in a concentrated form most of the valuable portions of the original debris. From these later deposits, and from original operations as well, come the stream sands that have furnished the material for the writer's investigations. These have chiefly been made on material from the counties of Butte, Plumas and Sierra, and from all classes of mines, but have also been supplemented by work on all samples ohtainahle from Yuha and Nevada counties and other portions of California. British Columhia and Oregon have also furnished samples for iuvestigation.

As the main ohject of the writer's studies in this line of inquiry was to determine the gold contents of the stream sands and to devise methods for their economic treatment, it hecame necessary to adopt some standard by which to define the stream sands as contrasted with other gold-bearing constituents of the gravels. For this purpose a standard of size of grain of sand was adopted of one-eighth inch diameter and lower, and of specific gravity of finished sample from 4.00 to 5.00. The grading and sizing was made hy riddles and sieves, and no concentration attempted until a size of oue-quarter inch was reached, when panning or percussion was used to standard size, below which very careful panning served for concentration of sample. In sampling original stream sands all gold above one-thirtieth inch in diameter was elimiuated, as helonging to the material treated successfully hy the methods now in use. The halance of the gold was extracted as far as practicable hy mechanical means, the pulp treated chemically, and finally determined hy fire assay whenever required.

In sampling tailings all the gold was retained to the final results.

The physical condition of the gold and other minerals was studied under the microscope and during every stage of the treatment with special reference to the character of the final waste products of the test.

Most of the samples sent to the writer, at his request, had previously undergone a most careful stripping of gold contents hy panning until not a color would he visihle to the unaided eye in a two-pound sample. Nevertheless, under treatment gold hecame speedily visible, and one such sample of black sand from tailings gave $354 per ton as the final result.

(To be continued.)

A System of Displacement.

W. W. Priestley, of Butte, Mont., is the inventor of a new pumping system which is now undergoing a practical test at the Gagnon mine. The *Inter-Mountain* says it is the simplest affair ever devised for raising water from mines, and those who have seen it at work are anxious to see it tested side hy side with some of the best pumps in the district, in order to determine its efficiency. The apparatus at the Gagnon consists of a three-inch pipe located in the pump shaft midway between the 1100 and 1200-foot levels and extending to the latter station. At the 1200-foot level this pipe makes a return bend and follows up the shaft to the 1000, where it is so connected that the water which passes through it empties into a tank at that station. This pipe thus forms a U, with one leg 50 feet and the other 200 feet long. A quarter-inch air pipe is inserted at the hottom of the long end or lift pipe, and when a certain pressure of air is turned on from the compressor and water is allowed to flow through the short leg, a constant flow of water is maintained down the drive pipe, and an intermittent flow of air and water is discharged through the lift pipe into the tauk at the 1000-foot level.

This system is known as one of displacement, the air displacing the water and causing it to rise until it eventually forces it out at the top. The fact that a quarter-inch air pipe, through which air at a pressure of twenty-three pounds flowed, actually forces the water through a three-inch water column to a height of 200 feet was doubted hy many until seen. To show the workings of the system, Mr. Priestley has constructed a very ingenious model of the pipe, attached to an air compressor. Working on the principle that, if air would carry water up, as it does in this case, water would certainly drive air down, he has reversed the lifting system and is enabled to carry air into a receiver, with a fall of four feet. The air thus compressed is then discharged in the same manner as it is in the ordinary air compressor used in the mines. By this system it is conclusively shown that the height to which a given pressure will lift or force water depends entirely upon the proportion of air to water in the lift pipe, and one of the advantages claimed for it is that a high column of air and water can be maintained with a low pressure, thus making it possible to utilize California redwood and kindred material as water columns. The system, it is helieved, can also he successfully applied to irrigation and placer mining purposes.

WHETHER or no the powerful searchlights used as safeguards in coast defense and on board ship are of much practical service against attacks from torpedo boats is still an open question. Tests recently carried on hy the Government show that a good torpedo boat carefully managed can approach to within 800 yards of the projector before being sighted, although she may be directly in the beam of light. This distance is the maximum torpedo range; and, as guns cannot be trained instantly under the most favorable conditions, a hoat would have time to make great progress, and perhaps inflict fatal damage; hefore she could be fired at. The German Government is having its boats paiuted bluish gray, as this color seems to he least visible by electric light.

Vanderbilt Mining District.

Written for the MINING AND SCIENTIFIC PRESS by Fred E. Lewis.

The mining camp of Vanderbilt is located in San Bernardino county, State of California, being only twelve miles west of the State line of Nevada, and thirty-five miles northwest of Blake (formerly Goffs) on the Atlantic & Pacific Railroad, and four miles north of Manvel, the present terminus of the Nevada Southern Railroad, the boundaries of the district being as follows: Commencing at a point on State line between California and Nevada near the Needles mountain, lying south of Crossman spring, thence northwesterly ten miles following the State line, thence southwesterly ten miles, thence southeasterly ten miles, thence northeasterly ten miles to place of beginning. This district was legally organized on the twenty-first day of March, 1891. It derives its name from Vanderbilt springs, located and named by government surveyors many years ago, and not as is generally supposed from the millionaire mine owner. The altitude is about 4400 feet, the climate being very hot in summer and temperate in winter. As a rule, a few inches of snow will fall in the winter and melt the next day. Most of the people live in tents the whole year.

The town of Vanderbilt, following the example of a great many old California mining camps, is built in a gulch, the houses being built on the side hills and the bottom of the gulch used as a street. It is built up of lumber and tents. A great many of the miners live in dug-outs and tunnels. Following is a description of the chief mining properties in Vanderbilt and vicinity.

Quartz Mills.—The Gold Bronze Mining and Milling Company has a ten-stamp mill which crushes about nine tons of rock every twenty-four hours, it having two concentrators. This mill is well supplied with water from Willow springs, it being piped for a distance of two and one-half miles. A. G. Campbell has a ten-stamp mill, with two concentrators. This mill has a capacity of twenty tons of ore per twenty-four hours. The power is furnished by two 50-horse power boilers and a 100-horse power engine, it being ample to run sixty stamps. Mr. Campbell's intention is to use the extra power in running an air compressor. This condensed air will be transmitted to the Boomerang shaft by means of pipes, where it will be utilized for hoisting purposes and for working rock drills. The supply of water is obtained from the Boomerang shaft, but is not sufficient at present, the mill only running twelve hours per day owing to the scarcity of water. The quantity is daily increasing as the shaft attains depth; in fact, if it increases as fast as it has done for the last fifty feet, at 600 feet or even if levels are run at 500 feet there will be an ample supply of water to run the mill night and day. Wood is used for fuel at these mills and it costs $5 per cord delivered.

Gold Bronze Mine.—This claim was located on February 1, 1891, by J. K. Patton, R. C. Hall and S. King, and has been more extensively worked than any other property in camp. Upon this claim four shafts have been sunk on the main vein, and several other shafts on cross ledges, most of these having been sunk by leasers. The main shaft is 245 feet deep; the west shaft, 49; shaft No. 2, 50; shaft No. 3, 83, and the Taggart shaft, 69. Fifteen hundred feet of drifts have been run, with thirty feet of crosscuts, and 310 feet of winzes have been sunk. Considerable stoping has been done. The ore is raised from the main shaft by means of a double-cylinder, flat-friction hoist of thirty-horse power. The steam is furnished by a sixty-horse power steel boiler for both the hoisting engine and mill. To give an idea of the quality of the ore shipped from this mine, we present a tabulated statement of the shipments for the year 1893. This was before the mill was built, and all ores had to be shipped by rail with the exception of 164 tons of second-class ore which was shipped to the Keystone mill, making a haul by wagons of forty-five miles.

TABULATED STATEMENT OF SHIPMENTS OF ORE FOR THE YEAR 1893.—GOLD BRONZE MINE.

DATE.	Works.	Weight, lbs.	Gold, ounces	Silver, ozs.	Gross value, per ton.....	Net value, per ton.....	Smelting and Freight, per ton.....	RETURNS.....
Jan. 14, 1893..	Selby & Co.	75,610	4.45	75.09	$96.48	$70.58	$25.90	$1,096.33
Jan. 27.....	"	31,174	4.90	6.20	98.04	68.79	26.50	1,121.29
Feb. 20.....	"	31,810	4.29	9.71	97.14	71.24	25.90	984.35
April 6.....	"	3,520	10.19	12.33	211.23	185.33	25.90	322.94
April 6.....	"	19,320	4.54	18.90	105.26	79.36	25.90	755.12
July 10.....	"	29,850	3.32	8.40	80.32	51.82	28.50	588.00
July 15.....	"	26,520	7.04	14.44	156.90	130.40	26.50	1,550.66
July 15.....	"	4,320	7.20	18.32	154.68	128.17	26.50	273.20
July 15.....	"	20,000	3.02	2.28	70.41	41.91	28.50	411.97
July 17.....	"	28,900	2.62	7.46	66.24	37.74	28.50	371.61
Dec. 15.....	"	26,046	3.73	8.64	76.56	47.31	29.25	616.25
To Keystone Mill, 164.85 tons, value $38.30 per ton.....								6,313.75
Total.....								$14,405.48

Gold Bronze No. 2.—This claim was located as an extension of the Gold Bronze mine, by the same locators and upon the same day. Very little development work has been done upon this mine, although leasers have shipped some rich ore. Three hundred and twenty-four tons of ore, averaging $90.47 per ton net value—after deducting $62.94 per ton for transportation and working—were shipped from this mine by the company.

Gold Bar and Gold Bar West Extension Mines.—This property was purchased by Mackay, Flood and Siste from the locators for $40,300 cash. This property is now known as the St. George mine. It is a good property, but not big enough for the owners to manipulate stocks on, so they prefer to let it lie idle, freeze out some of the smaller owners and continue to give the camp a black eye. I have it on reliable authority, from a gentleman who has made hundreds of assays from samples of this mine, that there is enough ore in sight in the drifts and shafts to pay for the erection and running expenses of a ten-stamp mill. There are four shafts sunk upon this property, the deepest of which is 325 feet. The ore at this depth will run $37 per ton in gold. Three hundred feet of drifts have been run, in ore all the way. There is ample water in the shafts to run a ten-stamp mill. A hoisting engine and pumps are used at the main shaft.

Queen of the Night.—The main shaft on this mine is about 100 feet deep, showing a body of high-grade ore. A tunnel has been driven along the vein, and considerable other development work has been done. For the amount of work performed, this is one of the most promising looking mines in camp. There is about three feet of water in the main shaft, which, when hoisted out, will rise to the same level in twelve hours. A whim is used for hoisting purposes.

Boomerang Mine.—This mine is owned by A. G. Campbell. The main shaft is 500 feet deep, with ore all the way. Levels have been run from this shaft connecting with the east and west shafts, which are 100 feet deep. Three hundred tons of ore from this mine, run through the Campbell mill, averaged $22 per ton in gold, eighty per cent of which was saved in the bullion and ten per cent in concentrates, leaving ten per cent in the tailings. Adjoining this mine are located the following mines, all owned by A. G. Campbell, and all showing more or less high-grade ore: Brick, Little Brick, Little Brick No. 2, Iron, Webster, Alta, Mill Site, Mill Site No. 2, and several others. There are several other good-looking prospects in this camp, but the owners are waiting for some one to come along and pay them a good price for a piece of ground that a pick has not been struck in. What this camp needs is capital to develop some of these prospects. Then, and not until then, will Vanderbilt make a good camp.

Crescent Mining District.—This district is located about twelve miles northeast from Vanderbilt, and is in Lincoln county, Nevada. The Legal Tender Mining and Milling Company has a five-stamp mill. This mill has one concentrator and crushes about ten tons of gold ore per day of twenty-four hours. This ore has averaged $23 per ton in gold, 72 per cent being saved in the bullion, 22 per cent in the concentrates and 6 per cent going in the tailings. The water used in this mill is pumped from a well fifty feet deep, and the supply is inexhaustible. The Legal Tender mine is located three miles east of the mill, the ore being hauled this distance by wagons. Shaft No. 1 is 220 feet deep and shaft No. 2. is 160 feet in depth; from these shafts there are 900 feet of drifts run, with stopes, winzes and upraises. The footwall is composed of granite and the hanging wall of porphyry. The vein is four and a half feet wide and the pay streak will average eighteen inches.

Phelps Bros. have 100 feet of shafts and 120 feet of drifts at their mine. The vein is four feet wide and the pay streak from ten inches to two feet in width at about 250 feet in depth and increasing in value in nearly the same proportion—milling about $25 to the ton in gold at the surface and over $100 per ton at 250 feet in depth. Water is reached at a depth of 100 feet from the surface and increases as depth is attained and more ground opened up.

width. Thirty tons of ore shipped from this mine to the Legal Tender mill netted $45 per ton.

At Hassett Bros.' mine they have a shaft fifty feet deep, with sixty feet of drifts and open cuts. The vein is three feet wide with a pay streak from ten inches to two feet in width. Twenty-nine tons of ore were shipped from this mine to the Legal Tender mill, which gave returns of $20 to the ton in gold.

Keystone Mining District.—The mill, which has ten stamps, is situated about forty-five miles north of Vanderhilt, and is three-quarters of a mile east of the corner common to San Bernardino and Inyo counties, California, and is in the State of Nevada. The mine is located seven miles easterly from the mill. This mine has paid large dividends and is a first-class property. A few miles to the east of this property is the Goode Springs mining district, which is almost entirely a lead and silver camp. Thousands of tons of lead ore are anxiously awaiting the arrival of the Nevada Southern Railroad, which is going to start to extend its road on the first of next month.

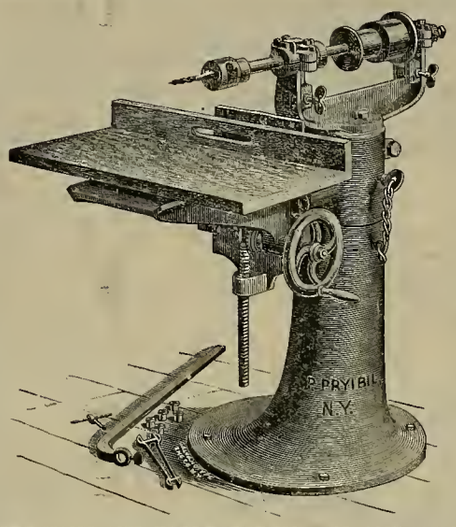
Vanderhilt is the central point for the following mining districts: Goldstone, Ivanpah, Shadow Mountain, Crescent, El Dorado Canyon, Goode Springs, Keystone, Sterling and Montgomery.

Angels.

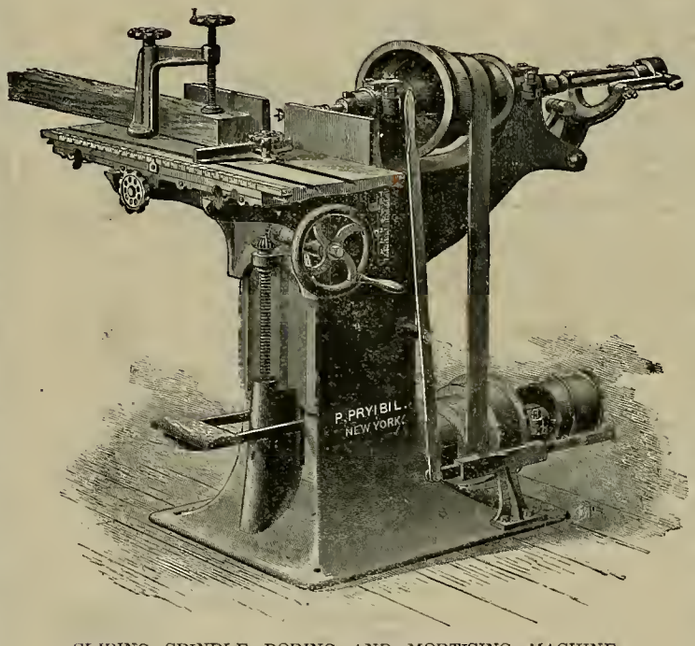
TO THE EDITOR:—To the old subscribers and those who have visited Angels within a year past, there is but little that is new. Mr. C. D. Lane put it very concisely when he replied to my question of "What shall I say for the Utica?" by answering, "Well, you can tell the boys that we're still doing business at the old stand and pegging away old fashioned." There has at no time been any signs of a boom at Angels. The leading mines work along like some machine, increasing the plant and force as they are required. If there is any boom, it is in the gradual and steady extending of the town limits and in the new residences that are being erected in every direction. When the extent of the mineral belt at Angels is considered, the present operations are scarcely a beginning to mine. I have been over this ground since 1870, and each trip confirms me in the belief that Angels is destined to be the greatest mining town in the State. The town is right on the mineral zone which here crosses the country from east to west, while the numerous veins run from south to north and northwest. One mile east of the Utica are the Birney mines with their large bodies of mineralized slates. Between these mines and the Utica no prospecting has been done. West of the Utica is the Johnnie Meyers, on what is called the middle branch of the mother lode; and still farther west is the Madison and others on the west branch. To the west is a flat section that has been ground-sluiced off, almost the entire distance, and shows numerous unprospected ledges, while a mile west of the Utica is the Blair mine with its large body of high-grade ore, and still farther on a half mile to the west is a strong ribboned quartz ledge resembling the mother lode in Amador county. There are other very strong ledges outside of these boundaries, but in this belt there is a space of two and a half or three miles wide across it, traversed by strong ledges and mineralized bodies of slate, thus giving this section an area of undeveloped mines beside which the few in operation are scarcely a scratch on the surface. Then, too, there is a long stretch of virgin ground to the north, running for miles in extent, while but little has been done to the south. The investor has but to carefully examine the locality to see that at Angels an unlimited amount of capital can be invested in the development of virgin ground.

The Utica Mining Company, C. D. Lane, general manager, being the largest operator and heaviest producer of bullion, places it at the front. On the Utica-Stickle mines the sixty stamps of both mills are constantly dropping, giving the company, with the forty stamps on the Madison, 160 stamps under its name.

All of their plants are operated by water power from their own ditch systems under 400-foot pressure. At present the company is putting in an electric lighting plant that extends from their plant about a mile above Murphys to Angels, a distance of about eight miles. This plant will furnish light for all of the mines, mills, streets and houses of Angels, and will be a great convenience and blessing to all parties. The chlorination works of the Utica Co., with their four furnaces, handling seventeen tons of sulphurets every twenty-four hours, are the largest known, and owe their reputation for good work to the gentleman in charge, Mr. T. M. Smith, under whom the plant has grown to its present proportions. John Reaves, who had been Mr. Hayward's trusted millman for years, has "gone over the divide," and his assistant, Mr. W. J. Loring, appointed in his place. Mr. C. D. Lane's son, T. T. Lane, is general superintendent of the company's mines. It is hardly necessary to say anything of the Utica's output, as it is a matter of history, but at this time the Stickle is said to be producing "candle-box ore" in goodly quantity. The management of the whole property shows how it is possible to work a large property to a greater profit than a small one. There are no "soft snaps" held down by friends, but every man on and about the property has to be up and doing to "get there" on time. This is particularly noticeable in the mills. Step into the Madison mill and you will find that one man is doing all the work on his shift, thus reducing the labor per stamp to almost nothing, and in no way to be compared to the small mills with about one man to the stamp instead of one to forty. Of course this requires the millman to get a move on him, and all the Utica employes seem to have caught the spirit of the management and work together like a great piece of machinery in producing the results that have made the Utica famous. At the Madison the superintendent, Mr. Naylor Williams, has the shaft



FREE HAND AND TABLE BORING AND MORTISING MACHINE.



SLIDING SPINDLE BORING AND MORTISING MACHINE.

down over 900 feet, with levels all run on a seventy-five foot vein, and sufficient ore in sight to keep the mill running for many years to come. Climbing up the upraises in this mine is more like scaling the side of a mountain on account of the magnitude of the ore bodies. The shaft is on the hanging wall vein. What answers for a foot wall is evidently a horse of slate or the gangue of the vein. The present workings are all done dry, which goes to show that the footwall has not been reached, while on a property to the north there are two strong ledges, still west of this vein, and the extreme west ledge is in a sea of water. The Madison is an immense mine as it is, but with a crosscut run west 300 feet to the footwall there will be scarcely any limit to its possibilities. Just north of the Madison is the old Gold Cliff, where W. Garrard mines and mills for 65 cents a ton from his quarry 100 feet wide. North of this is the Smyth, Ryland & Brown Co.'s mines, where three veins are shown. South there is but little doing save on the Bolitho & Tullocks mine. In the Bolitho they have several veins from eight to thirty feet that they claim mills from $6 up. On out beyond the Bruner, which is idle, is the Carson Creek M. Co.'s mines, formerly known as the Doc Jones mine. Mr. E. W. Roberts, the superintendent, has put in a new hoist since my last visit and has the shaft down to 465 feet, and is still sinking and drifting on the vein. A crosscut of forty feet has been driven on the 400-foot level without reaching the wall. In the upper levels the vein is eighty-five feet wide. The mine is equipped with a complete forty-stamp mill operated by water power. Owing to the nearness of a line reef the ores differ from those at Angels in this that there is a small per cent of free gold and a large per cent of silver in the form of tellurides. East of Angels the Birney mine, with Mr. T. L. Birney as superintendent, is just getting its five-stamp mill in operation. The company have four locations on two parallel veins. The ore bodies are very large and carry about five per cent of sulphurets that go $65 a ton. The free gold value has not been determined. With the present mill the company can develop and prove their mines, and appearances would indicate that it will prove a big property. West of Angels a Seattle company have put up a five-stamp mill on a sixty-five foot shaft. Their surface prospecting shows a mineralized belt seventy-five feet wide that they claim will mill $10 a ton. To the west the Eclipse is idle, while the Gold Hill is dropping ten stamps. South and still west J. J. Schmadeke has the shaft down 268 feet on his Blair mine and a crosscut run eighty-two feet without striking either wall. The twenty-stamp mill is running on ore said to mill from $20 to $22 a ton. The mine is under bond to a New York company. About five miles east of Angels and near Vallicita a Michigan company, with A. Lunberg as superintendent, has put a shaft down sixty-five feet and are drifting on the Isabella mine. The gravel mines of Vallicita are idle, but at Balakalava Hill, just south of Vallicita, a company have struck the old channel at a depth of over 200 feet and claim six feet of gravel that goes $15 to the car. North, at Douglas, McCormick, Frishee & Thomas have completed their tunnel to Central Hill, above Murphys, and will soon have their mine in operation. If space would permit, a detailed description of these and many other mines in the vicinity of Angels would no doubt prove of interest, but the investor contemplating investment cannot do wrong in visiting the camp, where, if he will make his own examinations and steer clear of bar-room experts, he will find no trouble in securing a promising claim at a nominal figure.

E. H. SCHAEFFLE.

Murphys, Cal., Nov. 26, 1894.

Free-Hand and Table Boring and Mortising Machines.

Herewith are illustrated a free-hand and table-boring and mortising machine and a sliding spindle boring and mortising machine, made by P. Pryibil of New York. The former is designed for boring either with or without the aid of a work-table.

The table has a vertical movement of eight and one-half inches, slides forward and back; and, when made for mortising, sideways also. Adjustable stops limit the extent of all these motions.

Mortising is done with a revolving tool, cutting on both end and side, producing, when the work is moved sideways, a mortise with half-round ends.

The slides upon which the table and its knee are held are fitted to the round body, and are held in position by a pin. When free-hand work is to be done the pin can be withdrawn, and all of these parts swung around to the side of the body, leaving the front clear of all obstructions.

The latter is adapted to a large variety of work, including rosette cutting and mortising, done by a tool cutting at both end and side, producing, when the work is moved sideways, a mortise with half-round ends.

The spindle is of steel, fitted to a steel tube, with which it revolves and in which it slides. The wear is thus confined to the tube, where it can be easily taken up by adjustable caps. When spindles slide in the same bearings in which they revolve, they become smaller at one part than at another, and a perfect adjustment is then impossible.

The spindle has a longitudinal movement of six inches, and it is provided with an adjustable, gibbed stop-collar.

The table has a movement of ten inches in the direction of the length of the spindle to enable it to be set close to hits of various lengths and to enable rosette and mortising cutters to be used close to the bearings.

It also has a vertical movement of twelve and a lateral movement of twenty-six inches. The latter is effected through a hand-wheel in front, and its extent can be limited by two adjustable stops provided for the purpose.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XIV.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894.

Asphaltum was known to the aboriginal inhabitants of California, perhaps long before the advent of the Spaniards; it is certain that they knew some of its properties. This is proven by an interesting relic shown me in San Luis Obispo county, by Mr. James Cormack. It is a stone mortar which has been broken by the pestle, the bottom having become thin by long continued use, perhaps by several generations. An attempt had been made to mend the utensil with asphaltum. This ancient record was found deeply buried in the driven sands, overlying the bituminous deposit.

1602.—The first notice of petroleum in California that I can discover, may be found in the account of the voyage of Captain Sebastian Viscaino, in the year 1602, written by Father Miguel Venegas in his "Natural and Civil History of California," published in Spanish in Madrid in 1758; and in English in London in 1759. The following, quoted from "Monarchia Indiana," written by Father Juan Torquemanda, may be found in Vol. II, folio 253:

"The Capitana and tender did not meet with that obstruction from the painted mountain as the Almirante had, but entered a good harbor, which they called 'San Bartholomew,' three leagues on this side of the island of Ceros. Here the General sent Ensign Alarcon and some soldiers in search of water, but they found none, that country being exceedingly barren. Along the shore they indeed met with a kind of resin, but, being of an ill smell, they did not think it worth while to take any of it with them. According to their account, it should seem to be amber; but whatever it be, there is enough to lade a ship."

Asphaltum was well known to the Jesuit Fathers in California, who used it for roofing and other purposes. The black maltha, oozing from the hillsides or standing in pools, and the hardened variety, called by them "brea" or pitch, were well known and familiar objects. They knew also of the oil floating on the sea in the Santa Barbara channel, but were not aware of its origin or value.

1841.—In 1841-2 M. Duflot de Mofras visited California in the interest of the French Government, and his report was published in 1844. He noticed and examined the numerous "tar springs." The following translation is by Professor William P. Blake (Pacific Railroad Reports—Geology, Vol. V, fol. 284). The original may be found in "Explorations du Territoire de l'Oregon, des Californies et de la Mer Vermeille, executee pendant les anuees 1840, 1841 et 1842.—Paris, 1844."—Vol. I, folio 357:

"Two leagues southeast of Los Angeles there are four great sources of asphaltum, situated on a level with the earth in a vast prairie. These springs open in the middle of little pools of cold water, while the bitumen possesses a higher temperature. The water has a mineral taste, which, however, does not prevent animals from drinking it. At sunrise the orifices of these springs are covered by enormous bubbles of asphaltum, often being more than a yard high and looking like soap bubbles. According to the warmth of the air, the gas contained in these bubbles expands and bursts, producing a rather violent detonation. The inhabitants gather the solidified asphaltum and use it for covering the roofs of their houses, formed of reeds or pieces of wood. Vessels carry the bitumen to different parts of the coast. This material has, nevertheless, the inconvenience of melting in the sun, running down from the roofs and penetrating through the roofing. The houses covered with it require particular care but small expense, since the springs are worked by any one according to their wants."

1850.—While it has been shown that the existence of asphaltum and maltha in California has long been known, it was not until 1850 that any noteworthy attempts were made to produce artificially or to discover mineral oil; although Andreas Pico knew the locality, now Pico canyon, a number of years before that date, and actually made a little oil for the San Fernando mission, in a little still. He was, therefore, undoubtedly the pioneer oil producer of the State.

1853.—Professor Blake thus describes the manner of making asphalt roofs, at the time of his visit in 1853:

"The residents of Los Angeles make use of large quantities of the material for covering their buildings and for pavements. It enables them to make roofs that are almost level, completely water tight; and it is spread upon them in the following manner: The asphaltum is taken early in the morning, when it is cold and brittle, and broken into small fragments; it is then spread upon the roof, and the heat of the sun melts it down into one homogeneous crust. When the inclination of the roof is great, or the asphalt freshly applied, it runs off at the eves and is a source of annoyance to pedestrians. After a considerable quantity has thus run down, it is thrown up again, until at last it becomes so much hardened that it is no longer made liquid by the sun. * * * * * The value of this material for making pavements, soft cement and the manufacture of gas and oil, cannot be lightly estimated, and it should be regarded as one of the valuable mineral productions of the State."

1854.—In 1854 G. S. Gilbert gathered and distilled oil on the Ojai rancho, and Julio Peralta dug pits and gathered crude maltha.

(To be Continued.)

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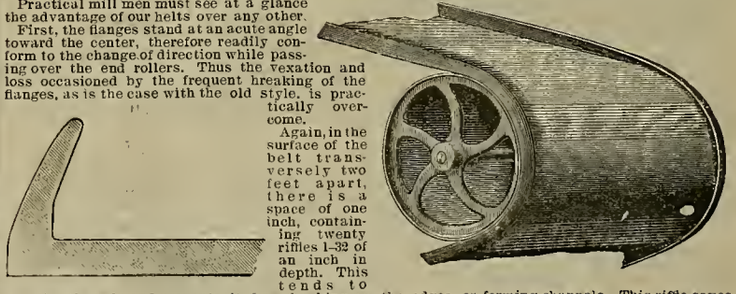

Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

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Stamp Cam.

Scientific Progress.

Luminescent Electric Lights.

H. Ebert contributes a paper to *Wiedemann's Annalen* on the prodnction of light by high frequency currents, in which resnlts are indicated likely to prove of importance. The fundamental difference between the light and that associated with Tesla's name seems to be in an insistance upou the principle of resonauce. He says that it is not necessary to use high tensions since it has been found that intense light effects can be produced by the movemeut of exceedingly small quantities of electricity, provided only that the oscillations follow each other regularly and are persistent. The luminous substance of Ebert's "luminescent" lamp is said to be a small disk of compressed luminous paint. This is enclosed in an exhausted glass receiver npon the external surface of which are glued two strips of tin foil to which the terminals of the circuit are attached. When the electric oscillations act npon these coatings, active cathode rays are formed on the inner surface. These, though almost iuvisible themselves, produce a strong luminescent light upon the surface of the luminons paint.

To determine the efficiency of the lamp it was compared with the amyl acetate standard. Its candle power was fonnd to be about one-thirtieth of this, which is approximately equal to the standard expended in producing this light—only about one-millionth of a watt.

Economy in Superheated Steam.

In the long series of losscs that occur in the latent power of fuel burned nuder a steam boiler, one of the most important is that which results from condensation in the cylinder. One of the devices resorted to in order to lessen this waste is to surround the cylinder with a chamber in which there is live steam, thns maiutaining the heat of the walls of the inner receptacle. Another is to let the steam do only part of its work in the first cylinder, and then enter a second, and perhaps a third and fourth, before its energy is all utilized. Besides usiug a steam jacket aud compounding the engine, it has also been proposed to superheat the steam before making it drive a piston. Steam taken right off from the water in a boiler has only the temperature of boiling water. In that condition it is said to be "wet" or "saturated;" and the slightest reduction of its temperature will be attended with partial condensation. If, however, the steam be let off into another vessel and there subjected to a higher heat, it can undergo contact with thc cylinder without the same liability to condensation and loss of power. Obviously, there would be no economy if it took too much more fuel to do the superheating, or, if the added apparatus were very costly. But by so arranging the snperheater that what would otherwise be waste hcat may be ntilized, there is a net gain in work performed.

Effect of New Inventions.

While labor-saving machinery and new inventions curtail the need of manual labor in the affected industries, they cheapen production and frequently transform to practical necessaries what under the old order were luxuries. Thus labor that is dispensed with in one form finds call for occupation in another. The introduction of electric cars for street railways has cheapened horse flesh iu the cities and reduced the profits of the shippers of and dealers iu horses, but it has furnished labor with a new outlet in the direction of the installation of the electric system, with what that involves of improved highways, more substantial tracks, the stringing of wires, the building of expensive cars aud the erection of suitable power buildiugs, eqnipped with costly dynamos. A case in point is the construction by the Metropolitau Street Railway Company of New York, at a cost of almost $1,000,000, of a five-story building, to be nsed principally for the storing of 250 cars. Immense elevators will be used to lift the cars above the ground floor. Great as this expense will be, the company regards the project as one iu the direction of an cconomical management of its railway system.

Platinum.

Platinum, when used for chemical laboratory instruments is hardened by the addition of a small percentage of iridium. This forms au alloy much harder and more tenacious than pure platinnm, besides offering a greater resistance to the action of chemical agents. An alloy of platinum with ten per cent of iridinm is only slightly attacked by aqna regia, which readily dissolves gold. This is due to the formation of a thin film of iridium upon the snrface, which reuders it indifferent to chemical action. Although platinnm is not oxidized or rusted by the air at any temperature nor attacked by any single acid, yet it is not by any means invulnerable. There are many substances which attack it—phosphorus and arsenic, for instance—and direct contact with burning charcoal renders it brittle and liable to crack. When platinum utensils become gray and brittle from this and similar causes a systematic application of moist sand after using will restore their brightness and materially prolong their life.

The Ural platinum deposits in Russia are said to be the only ones in the world, as this metal is worked nowhere else, and is known simply as a mineral finely disseminated in certain rocks. Platinum occnrs in the Ural Government of Perm, where it is found on various private properties and State lands. In the district of Goroblagodat there are seventy allotments for the exploitation of platinum nnder different private individuals. At present all the platinnm extracted in the Urals is forwarded in the crude state to St. Petersburg, whence it is sent abroad. Although there are two laboratories in the Russian capital for refining platinnm ore, the greater quantity is seut abroad in the crude state. The largest quantity of platinum is now extracted at the deposits of Nizhni-Tagilsk, belonging to Priuce Demidorff San Donato, and at the Krestovosdvigensk deposits of Count Schouvaloff. In 1890 there were 6000 workmen employed in the exploitation of platinum.

There are said to be only six tons of platiunm commercially in existence; it is indispensable for glow electric lamps, for no other metal as good an electric conductor can be fused into the glass. Therefore, its price has increased within recent years many hundred times, and threatens to go higher yet. Either a substitute conductor will have to be discovered, or a new variety of glass made with a coefficieut of expansion uearer that of ordinary metal.

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THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from G. H. Pease and J. B. Colwell in the North River mine, near Yankee Jims, Placer county, Cal., to impound tailings behind dam in Mexican Gnich; and from the Crown Point Mining Co., in their mine in the Tp. of Goodwin, Plumas county, Cal., to impound tailings behind log and brush dam in Porter Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Dec. 17, 1894, at 1:30 P. M.

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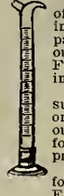

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Mechanical Progress.

Ogden's Great Electric Power Plant.

Details of the proposed electric power plant at Ogden, Utah, are published in the Salt Lake *Tribune*. The plan calls for damming the Ogden river, at the upper end of a narrow canyon in the Wasatch mountains to the northwestward of the city. The structure will be 450 feet long, 60 feet high, curved slightly, placed with the convex side upstream, and have rock ledges for abutments. It is intended to impound enough water to maintain the production of 10,000-horse power the year round.

For nearly five miles along the canyon the water will he carried from the dam in a circular wooden conduit, put together like a barrel, with staves and steel hoops. The former will probably be of either California redwood or Texas pine, two inches thick, and the latter five-eighths of an inch thick. This kind of conduit has been tested extensively enough in the far West to be considered safe and durable, as well as cheap. Owing to the irregularity of the bottom of the canyon, it will be necessary to support the aqueduct (which will have a diameter of six feet) on trestles at various places. In other places short tunnels must be dug. A perfectly straight pipe, however, will not be attempted. To adapt the conduit to some of the depressions in the line, curved elbows of steel will be employed. At least sixteen angles will be thus provided for, and it is not believed that the flow will he sensibly affected thereby.

The canyon terminates nearly a mile from the point selected for the power-house in Ogden, and for this portion of the route a steel tube will he necessary. At the terminus, the head of water (or level below the surface of the reservoir) will be 350 feet. In the power-house there are to be ten dynamos, each directly connected with its own turbine wheel, and capable of delivering a plump 1000-horse power in the form of electricity. Not over one-quarter of this energy is likely to be utilized by existing industries, but it is hoped that new ones will he established in that vicinity soon after the completion of the works, thus creating a good market for the power about to be developed.

As illustrating the loss of fuel which may arise from improperly hanking fires under steam boilers at night, the *Electrician* cites an instance in which it was the practice to bank the fires at 6 P. M. and close the main damper of the fire, leaving the fire doors open. The hoilers were of the water-tube type and at the time of hauking carried 100 pounds steam pressure. The main damper was not perfectly tight, and sufficient air was drawn in to cool the hoilers until the pressure had fallen to ten pounds when the fires were opened at six o'clock the next morning. Subsequently the practice was changed by closing the fire and ash doors, and by also closing hand-dampers in the flues, which were found to be tighter than the main dampers. As a result, the steam pressure in the morning was invariably found to be at least forty pounds, and the bank of coal, which under the previous conditiou was more or less consumed, was apparently in the same condition as when the fire was first banked.

A CERTAIN TEST of steam pipe coverings leads to the conclusion that it costs $15.40 to run 100 feet of naked two-inch pipe at from 70 to 80 pounds pressure for one year of 3000 workiug hours, with coal at $2 per ton. With the least efficient of insulating coverings used in the test this loss could be reduced to $4, with the most efficient to $2.64. Striking as are these figures, they are probably helow the cost of actual practice, for a steam pipe is under pressure usually more than ten hours a day, and $2 a ton is helow the average cost of coal. Prof. Charles B. Gihson, in some tests a few years ago, reached the conclusion that with coal at $4 per ton and 3000 working hours per year, the loss from a naked two-inch pipe was 64¾ cents per linear foot. The lowest estimates show the importance of covering the pipes.

THE accumulation of harnacles and other marine growths on the hulls of vessels exerts an influence upon speed and coal consumption far greater than is popularly supposed. The United States steamer Bennington recently ran from Acapulco to La Libertad, a distance of 675 miles, with a clean hull, at the rate of nearly eight miles an hour, and burned sixty-seven tons of coal. When she came back, two months later, she was able to make but little more than six miles an hour, with a consumption of no less than 129 tons of coal. This difference was wholly due to the mass of extraneous matter which had collected upon her hull, and which could not be cleared off without putting the ship in drydock. This fouling takes place to a greater or less extent in all waters, but is especially troublesome in the tropics.

IT is a singular fact that rails in tunnels last only about one-third as long as upon the open track, although subjected to exactly the same amount of wear. Nearly all the fuel used in locomotives contains sulphur, which combustion and the action of the exhaust steam in the smokestack changes to frec sulphuric acid. This issues from the stack often in as great quantities as five pounds an hour, but is soon dissipated in the open air and does little harm. In a tunnel, however, where the steam cannot escape, it condenses rapidly on the rails and leaves them subject to the direct action of the acid.

LIEUT. EDWARD BRINLEY, who had charge of the pneumatic dynamite gun on hoard the Nictheroy from the time of that vessel's commission in the Brazilian navy, has reached the conclusion that the range of dynamite guns is too small and their accuracy too poor to render them serviceable on board ship. The trials of the Vesuvius in the American navy seem to teach the same lesson and to prove that the proper place for this class of ordnance is on shore rather than afloat.

THE facilities offered for the moving of heavy machinery in the Government navy yards are seldom sufficient. When the hoilers of the Cincinnati were moved from the shops to the dock at the Brooklyn yard, the track provided was found to be much too light and "skidding" had to be resorted to. The cost of this primitive operation was over $3700, enough to have laid a suitable track the entire distance.

CEMENT PIPE, if properly made, is said to be quite as strong as the vitrified pipe more commonly used for sewers, and can be made in large sizes for considerahly less. Brooklyn is one of the very few cities in this country which continues to use the cement pipe in preference to the vitrified, and, although the former is more porous than the latter, its use has been entirely satisfactory.

A NEW TIRE for hicycles is made on the plan of the pneumatic, but has a series of transverse rubber disks within the tube, dividing its interior into a number of independent air chambers. Should one chamher he punctured the whole tire will not collapse, hut the two adjoining chambers, being still inflated, will enable the rider to continue his journey until the break can be repaired.

DR. DAGIL, a Russian physician, asserts that music produces warmth. It affects the nerve centers governing the circulation of the blood, and causes an enlargement of the blood vessels, and hence greater activity of circulation.

THE domestic uses of asbestos have increased wonderfully during the last few years. It is now made into paints, roofing, building material, cements, cloth, shovels, forks and sewing thread, and a number of other things.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE GOVER.—*Ledger:* Superintendent Hale of the Keystone has had charge of the Gover mine for some weeks, and is having the water kept out. He has put in three new electric pumps, which in about four hours' work keep the property clear of water. The mine is being kept free of water in order that if it is not disposed of in a short time, work will be resumed. The mill will soon be placed in first-class condition, so that if it does not soon pass into other hands, it will be worked hy those at present in charge.

The Zeile has suspended mining to repair the shaft and the mill. There is an accumulation in the sulphurets works which will keep them running for about two months. The shaft has to undergo a thorough repairing, which will require a small force of men, and the repairs at the mill will also take a small force.

Repairs at the Keystone mill are progressing rapidly. Twenty stamps have been put in good condition and the other twenty are now being repaired. The mortar blocks were repaired, the mill foundation renewed and new mortars put in. The new mortars are a great deal wider than the old ones and with the twenty stamps in good repair the superintendent says he is crushing about the same amount of rock he formerly did with forty.

The Swiss mine, near Railroad flat, which was bonded a few months ago hy James H. Tibbits and transferred to Dillana and Driggs, is showing a fine prospect. Men have heen at work for several weeks running a tunnel and sinking a winze. The winze is now down sixteen feet and the ledge upon which it was sunk assays $106 a ton.

General rejoicing and reconstruction is in progress at the Clinton Consolidated. The property will probably pass into the hands of new-comers, but if a sale is not effected the old company proposes to continue work. Clearing the water out of the shaft was commenced lately. C. Shea is superintending the work.

ZEILE.—Jackson *Republican:* About 100 men are laid off pending the repair of the shaft. The sump is heing cleaned out and a few stamps of the mill are in motion, crushing the rock taken from the sump.

Butte.

FORBESTOWN MINING NEWS.—At the Shakespere mine and mill the ore now being worked is taken out above water level, and there is said to be enough in sight to run the mill for two years.

WHAT A MINE WILL DO.—*Mercury:* A single mine giving employmeut say to thirty men does more good than most people are aware of. Take the Pershbaker mine on the Magalia ridge as an example. Aside from the wages paid to the miners, which is the first consideration, the mine henefits many others. Lumher is required, for this mine alone got 300,000 feet from a sawmill in the viciuity. Hay and grain are needed in considerahle quantities. The mill owners must have hay and grain, so hetween the sawmill and the mine the farmer is helped. There must be shovels, picks, drills, powder, fuse, caps, nails, iron, coal, etc., and thus the hardware stores are paid large sums. For the thirty men, together with the sawmill men, loggers and teamsters, there must be flour, beef and other provisions, so that the butcher and the grocer are benefited. Many of the lahorers are married and have little homes near the mine, and thus more money is expended for drygoods, tinware, boots and shoes and other supplies. Thus it is that a single mine employing any large numher of men confers a henefit upon all people within a radius of many miles.

PERSHNACKER MINE.—*Appeal:* The plans for the new works call for a double compartment shaft five feet deep, to connect with the face of the old incline; a pipe-line some miles in length to hring in water from the Cherokee ditch for power purposes; the erection of enough buildings to form a small town, and finally the installing of new, up-to-date, ponderous machinery to work the mine. These new machines will he models of ingenuity and correct mechanical construction. The principal power used will he compressed air, generated by the latest model Pelton wheels. Nothing like the plant that is now being erected has been seen in this part of the State hefore. The shaft is down ahout 240 feet. The work of sinking the shaft is heing done with an auxiliary steam plant, which was the first thing erected in the camp. The shaft is in a solid tough lava, and a progress of about two feet per day is heing made. It is calculated that the new machinery will he up hy New Year, and that the channel will be tapped and mining begun about the middle of the year 1895.

Calaveras.

THE GWIN MINE.—*Chronicle:* The Gwin mine has recently heen equipped with a water power hoist capable of sinking 3000 feet. The new eight hy eighteen feet shaft, timbered with twelve hy sixteen inch timher, is now down 500 feet, and the company, will never rest until the 1400-foot level is reached. A fund has been raised of $5,800, to construct an iron hridge across the Mokelumne river at Middle Bar, and connect with the Mok Hill and Jackson county road. The mine has connected with the Jackson telephone system. Work is heing vigorously pushed at the mine, and the knowing ones are sure that the old Gwin will take its place in the lead as a hullion producer.

GOOD TIMES AT MOKELUMNE. — *Chronicle:* For the past six months fortune seems to he throwing smiles on our mining interests. Many new enterprises have started, and the old claims are heginning to assume the aspect of mines. Many mining men are coming and going constantly. The camp is in a healthy state and a season of activity such as that section has not had for years, is promised.

The Gleeson mine, formerly known as the Coffee Mill claim, locatod in Chili gulch below the Junction, has come to the front as a dividend property. Steam works are used for hoisting purposes. There is a shaft 180 feet deep, where hlue gravel six feet in depth is found that pays $10 per day per man. Twenty men are engaged all told, and the gravel is washed through sluices. At least one-half the gold goes with the tailings. Mr. Gleeson is at present arranging for a ten-stamp mill.

MINING NEWS. — *Herald:* The Gold Hill mine started up recently, employing a force of seven men.

The Maltman mine on Smith's flat resumed operations for the winter, lately.

The ten-stamp mill at the Smedika mine is running regularly on good ore. The shaft is down 220 feet.

The Calaveras Consolidated mine has suspended operations for the present.

The extension of the Baumhogger quartz mine, near Altaville, has heen bonded to parties who will start at once to develop it.

The Gover mine of Amador county has changed hands again. M. J. McDonald, who was the latest owner, has made a deal with an English syndicate, on what he considers favorahle terms. There were many inquiries for the property, but this is the only one which has materialized.

Mariposa.

BIG MINING ENTERPRISE.—The Merced Gold Mining Company, recently incorporated in Butte, Montana, to operate mines at Coulterville, has decided to operate on a big scale.

Coulterville is showing the effect of the growth of interest in the mining boom there. Till recently the Tyro mine was the only large property operating. The vast Cook estate, comprising about 20,000 acres, and embracing several mines of known value, was knowu then and had heen idle for many years.

Recently the Cook estate passed into new hands and now all is activity. The Tyro is ahout to enlarge the mill, and active work is in progress looking to the rehabilitation of the various mines on the Cook property. This work will include the huilding of roads, reopening of the mines by means of long adits and new shafts, the construction of hoists and mills at various points, or the building of one large milling plant from which railroads will diverge to the several mines, and the installation of a large electric plant to the Merced river for the purpose of generating power to run the mills, railroads and other machinery.

There is no doubt of the value of some of the mines. There are two great fissures on the property, the mother lode and the west lode. These each have several large mines. At a point in the famous Pine Tree-Josephine miue on the Mariposa estate, situated on the south side of the Merced river, these great fissures diverge. The east fissure is the mother lode, which has such distinctive features as to make it readily recognizable for many miles to the northward, at least to Carson hill in Calaveras county. These features are the occurrence of immense quantities of magnesian iron lime carhonate, known as aukerite, which is always accompanied hy that peculiar grass-green scaly mineral named by Prof. Silliman "mariposite" (an iron magnesian silicate). Through this mass is a system of reticulated quartz veins, great and small, hearing gold, the ankerite being itself gold bearing at times, as at the Mary Harrison and Louisa. In the Rawhide mine, in Tuolumne county, it was fabulously rich. The walls east and west of this great fissure called the mother lode are at times hlack slate, again diahase and often serpentine. The principal mines on the Cook estate on the mother lode are the Mary Harrison, Daliah and Louisa. The west lode is a clean, well defined fissure in hlack slate, being usually accompanied by a light gray dyke rock. The vein is from a few inches to twelve feet and rarely twenty feet wide. The principal mines on this vein are the Tyro, not owned hy the Cook estate; the Potosi, Malvina and Malvina No. 2. A large amount of work has heen done on these mines in years gone by, and everything points to the conclusion that they are hy no means worked out. Under the improved conditions—the application of electricity, the cheapening of labor, lower cost of supplies, the use of modern explosives, together with less explosive and more successful metallurgical operations—it is believed that their working will result in success.

On the Mariposa estate, agents of the company, of whom Johu W. Mackey, John P. Jones and Alvinza Hayward are the principal owners, have been engaged in opening and sampling the numerous mines on the tract (over 40,000 acres). A five-stamp mill was erected on Missouri gulch, near the town of Mariposa, for this purpose, and hundreds of tons of rocks have heen tested. A revival of operations may be looked for in this locality also. The principal mines are the Pine Tree-Josephine, Mount Ophir, Princeton, Green's Gulch, Elizaheth and a new mine recently discovered in the vicinity of Mount Ophir.

Mendocino.

AT HOBOKEN FLATS.—Blue Lake *Advocate:* A. H. Griswold is inspecting the Granite Slide, a placer claim at Hohoken flats. A company with Mr. Fisk of San Francisco as manager has been organized to operate there and the machinery to operate the property has already been shipped.

Nevada.

THE SOUTH IDAHO.—*Union:* The stockholders of the South Idaho Company are more than pleased at the result of a crushing of five loads or ahout ten tons of ore from their mine at the Electric mill, which was cleaned up last evening. The rock yielded something over $1000 or a little over $200 per load, exclusive of sulphurets. The sulphurets are very rich and the ore is probably worth $200 per ton. The South Idaho is owned by a local company, most of whom are working men and we are never more pleased than to chronicle the success of a faithful prospector. The company intend as soon as possible to put up suitahle machinery and a small mill on their claim, and they then will he in a condition to receive some returns for the money invested. The South Idaho, as its name implies, adjoins the celehrated Idaho, (now the Maryland mine) on the south, and it is thought hy many that this location is as rich as the famous Idaho which produced over $13,000,000 in gold for its owners.

A crushing of five loads of ore at the Electric mill from the South Idaho mine gave a handsome yield of $200 per load exclusive of sulphurets.

Riverside.

PERRIS DISTRICT.—It is reported that an Eastern mining syndicate has honded the Convex mine, in the Perris district, for $20,000. The bonders will, it is said, at once begin work on the property with a view to a thorough development. A stamp mill will be one of the improvements made.

San Diego.

PICACHO MINES.—*Union:* The Picacho placer mines have produced more gold in the past thirty-five years than all the placer mines put together that are found within 100 miles of Picacho, while one gold quartz mining property alone has turned out $2,710,000 during the twelve years it run.

Sierra.

GOLD POCKETS.—*Messenger:* The successful tracking of a pocket requires considerable skill and a great deal of experience. C. M. and Asa Wilson, from eight pockets on their claim, which is known as the Twin Pocket Quartz Claim, have taken out over $3000 in less than two months. From the Golden Star Lode during the early part of the season, they realized $1200 in a short time. Ahout a month ago Messrs. Wilson and Jerome York found a pocket in Slug Canyon which paid them $189—pretty fair wages for one day's work.

The Houch hrothers are now working on their lode near the High Commission and are tracing what they think will be a big pocket.

R. Sparling, of Goodyear Bar, has proved himself to be an expert pocket hunter. During the past summer he has discovered several pockets, from one of which he took $1800.

Siskiyou.

MINING NOTES.—*Journal:* Schroeder's mine at Deadwood continues to yield good returns, and the mill is kept steadily in operation day and night. This mine is one of the best paying mining properties in this county.

At Fool's Paradise diggings near the mouth of Shasta river very rich prospects have been found in the quartz, some of the specimens almost half gold. The finds are evidently pockets, hut may lead to rich permanent ledges helow the croppings and floats.

The miners on Cherry creek are making extra preparations for the coming winter, with great hope of being ahle to secure a good supply of water, the only requirement necessary for realizing rich returns for labor performed.

F. Corhin received two mammoth hydraulic giants in Yreka recently, each weighing 1800 pounds, also a large lot of twenty-two inch pipe, to he shipped to Salmon river. Corbin & Co., have considerahle mining ground at the North Fork of Salmon river, with an ahundance of water to work all year round. A dam 180 feet long has been built across the river, and the ditch and flume therefrom are 4x5 feet in size, capahle of carrying an immense quantity of water. In case the water gets low at any time, a numher of lakes can be tapped to furnish more water above the dam. This mining property can he worked without hindrance summer or winter, as it is not over 2500 feet above sea level and is not troubled with deep snow more than we have in Yreka. All the placer ground honded and located hy Corbin & Co. is to he worked with a large force of good, practical miners, and we look for an exceedingly large output of gold dust when in successful operation.

We were shown an exceedingly rich specimen of quartz from Hungry creek recently, which does not indicate that the miners there are likely to go hungry with such quartz to handle. Gold is plainly visible all through the sample exhihited, which seems too rich to prove extensive. Another piece from the same locality showed sulphurets carrying considerahle gold.

The Empire mine at Empire creek, near Honolulu, on Klamath river, now shows a fine ledge ten feet wide, along which a tunnel is being cut for getting out the quartz as the work progresses. The quartz at present taken out averages from $7 to $8 a ton, and improves in richness, hesides hecoming softer, as the work of development progresses. The fine water power mill is kept steadily in operation day and night.

MINING NOTES.—*Journal:* The Quartz mines in Quartz Valley are paying unusually good this season, and considerable gold is realized to induce more extensive operations. The old Allen mine, owned hy Firth & Co., of San Francisco, has been opened in good shape, hy means of a machine drill, and a new quartz mill is now in course of construction. Sargent's quartz ledge is also yielding handsomely, and Abram Erno is likewise meeting with good success in crushing quartz with an arrastra.

It is currently reported that the Black Jack Blue Gravel Mining Company is likely to dispose of the hlue gravel mine in Cottonwood district, to an Eastern company making offer of purchase.

The ledge in the divide between Oro Fino and Quartz Valley, known as the Big ledge, is paying handsomely, and is three feet in width. This ledge was sold a year ago hy the executors of the Johnson estate to Whipple, Eastlick and others for $500, and has just heen houded for thirty days to a company for $5,000.

Jillson & Co., at Cottonwood, are making preparations for extensive operations during the coming winter, in working their blue gravel beds, and intend putting up a ten-stamp quartz mill for crushing the blue gravel cement from the old river beds of the Klamath.

J. R. Middlemiss, U. S. Commissioner, of Salt Lake City, who has been here lately with others in the investigation of our gold mines, has honded the hlue gravel mine at Greenhorn for thirty days, buying the dust taken out each day, to show capitalists in other localities what it pays, the water used for washing having heen pumped. This claim would yield from $1200 to $1500 a week, if plenty of water could he ohtained now as during the rainy months. The land adjoining, owned by Louis Nehrhass, has also been honded hy the same man, to be disposed of to parties desiring to invest in mines.

Shasta.

MINING NOTES.—*Democrat:* Matters at Triuity Center remain statu quo.

The rich ore hodies on the Strode claims are yielding handsomely.

At French Gulch the Gladstone is running five stamps.

The sale of the Washington has not yet been consummated.

The ditches for placer mining are all in shape and ready for work when it rains sufficiently to fill them.

At Whiskytown considerahle development work is being done on seam digging.

Samoni at the Gem Mill is putting in a new concentration plant from which great things are expected.

At Middletown B. B. Martin is ready to mill 300 tons of ore in his arrastra.

Jones & Christensen at Muletown have struck a rich streak and the little mill is cleaning up from $75 to $80 a day.

The Minnesota mill and mine are working a small force of men on rich ore.

Thos. Foster has resumed operations on the group of mines owned by him and rented the Hocket Mill on Flat Creek. The teams commenced hauling ore to the mill Mouday.

Vandevere and Billard are running their arrastra steadily. The ore averages from $18 to $20 per ton.

At Squaw Creek thirty stamps and a Huntington mill, together with the wet chlorination plant, handle the output of the Uncle Sam mine.

Mr. Ellis is still working a force of men on the Balla Kallalla.

At Quartz Hill, thirty tons of ore are being sent to the mill daily. The mill has a new roof and Morris tahles and is in good condition for winter.

At Upper Springs Jas. Sallee will commence the erection of his ten-stamp mill next week.

Alex. Ludwig is ahout to sell his large gold ledge near Igo to a party from Oregon who proposes putting it through a concentrator.

GLADSTONE MINE.—*Democrat:* The mill at the Gladstone mine has started up and will now run right along. Men are being put to work, and the mine will soon be running on its old time.

Trinity.

The Altoona company met with quite an accident a few days ago. The boilers were set in solid masonry in a cut in the mountain. A small sized landslide came down and moved the whole structure several feet. The Cornish pump and hoisting works are doing fine work. The shaft is now down 150 feet in the ore. Four levels, all at right angles, are run from seventy-five to 150 feet each in solid ore. The furnaces are in operation handling forty tons a day. The company expect six tons of quicksilver as the output, this being the minumum. The greater part of the ore runs from twenty to twenty-five per cent in murcury. The present output is only worth $4200 a day, or $126,000 a month. It is safe to predict that $110,000 of this will be profit.

ARIZONA.

PROBABLE LITIGATION.—*Times:* The English Company at Picacho, above Yuma, recently took out $500 from their mines in two hours. The great pumping plant is working successfully. This is the property just located hy Montana capitalists on the ground that it is held hy English aliens contrary to the United States mining laws. Injunctions have been served and one of the fiercest struggles over miuing property ever seen on the Pacific coast will he commenced, as hoth sides are backed by millions of capital.

AN AURIFEROUS PROPHECY.—Yuma *Sentinel:* Some sixty miles east of this city and two miles south of the Mohawk section house on the Southern Pacific Railroad can he seen a large force of men at work. This is the mining camp of Professor Howland of San Francisco. It will be remembered that last summer the Professor located in that section several miles of placer country and did considerable work on one of his many claims. Hot weather came on and work was stopped until cool weather set in. The Professor claims that in the prehistoric age of Colorado a river ran where he is now at work. He says that with the assistance of his divining rod he has traced the Colorado river hed of ancient times from its fountain head in Utah to the Gulf of California. Near the ranch of George W. Norton, in the Mohawk valley, is where it crosses the Gila river, and from that point the old channel takes a southerly course until it reaches the gulf. At the place where the Professor has his men now at work he feels positive lies buried untold wealth. He has a large number of men at work night and day sinking two double compartment shafts. They are working in shifts of eight hours. They get good wages and their money is well earned. It is the prophesy of the Professor that when the bedrock of the ancient Colorado river is reached

gold will be takea out in bucketfulls and shipped by trainloads.

CHLORIDE DISTRICT.—Under date Nov. 26th, our correspondent writes: "The mining excitement which years ago ran so high here and at Mineral Park and subsided is reviving again. A number of mills that have boea idle for years are starting up again and some new ones being built, but the center of attraction in this county now is the White Hills some thirty miles west of this."

BRITISH COLUMBIA.

A RICH POCKET.—A. L. Beaten, of the Vandall placer mine, French creek, Big Beud, arrived down this week with his pack train, which he is taking to winter quarters at Deer Park, Lower Arrow Lake, says the Kootenay *Mail* of Revelstoke. Three men took out $1500 worth of nuggets in three weeks, from a pocket, the bottom of which has not yet been reached. Six men will be employed on this mine during the winter.

NAKUSP NOTES.—J. A. Finch has thirteen men working on the Silver Roll, in the Slocan.

Ten tons of ore are brought into Silverton daily from the Alpha and Fisher Maiden.

The wagon road from the Idaho basin to the concentrator on Hamson creek, in the Slocan, is finished. The distance is five miles and the cost $6000.

The concentrator on Hamson creek one mile from Three Forks, will be in operation next month. It will cost $30,000 and has a 100-ton daily capacity.

COLORADO.

A NEW PROCESS.—Among other and many processes which have been and are being tried for the bettering of results obtained in stamp mills is one now being experimented upon by C. D. Coe of Leadville from the waste waters from the Black Hawk stamp mills. The machine used consists of a cast-iron pipe four-inch in size, through which the waste water or slimes passing down the creek are forced into a hath of quicksilver. The machine is in appearance somewhat like a kettle, with a horizontal spout, the haths being rippled. The kettles are charged with 250 pounds of quicksilver. The water is introduced in the bottom part of the kettle. By the agency of a screen, it is divided into a hundred smaller streams, and by its pressuro in the column forces itself through the mass of quicksilver. In order to recover a large percentnge of values from refractory ores, Mr. Coe found it advisable to experiment with different solutions. He has eventually obtained results which are gratifying to him at a very small cost. He claims that for free float or any other form which escapes from stamp mills, it cannot be excelled, and that when used in placer mining the method employed cannot be surpassed.

IDAHO.

AT BURKE.—*Statesman:* The Cœur d'Alene Silver & Lead Miniug Company are working a force of 200 men and are running day and night. They are taking out 10,000 tons of crude ore and shipping from 1600 to 1800 tons of concentrates per month. The outlook is poor, owing to the price of lead, and the miners and mine owners are discouraged. The Tiger mine is running day and night, employing eighty men and milling thirty tons of concentrates daily. An English syndicate has had experts there for some time investigating, and it is understood a bond has been given them on some of the properties.

Cœur d'Alene *Miner:* Of the thirty-five or forty men who have been working at the Mammoth, all were discharged with the exception of seven or eight who are retained on development work. These will continue to drive forward tunnels No. 2 and No. 3. The owners state as the reason for closing down that they cannot afford to exhaust their mine at the present prices of lead and silver. The fact that they are continuing the development of the mine indicates that they have confidence in the future.

THIRTY FEET OF ORE.—A Burke dispatch says. Another strike has been made in the Tiger mine. A few weeks ago the Tiger was a great mine, with fifteen feet of ore body. Soon thereafter the vein began to widen, and when it reached twenty-three feet the canyon was delighted. Now the Tiger has beaten all previous records. It has thirty feet of ore, ten feet of which is solid galena that will not require concentrating. An assay hy the company gives eighty per cent lead and forty-one and a half ounces of silver.

A GOLD LEEGE.—An interesting discovery is reported from Idaho City, forty miles from Boise, in the center of the old placer region known ar Boise Basin, which produced such great quantities of gold in the early days, and which still has a large output. There is a false bedrock on which the gold was found, and it has long been the theory of miners that gold existed beneath it. To test this theory, a hole was drilled through the false bedrock. It went through the sand and clay without bringing up anything of value. At a depth of about 450 feet granite was struck. On the possibility of there being a boulder strata beneath sinking was continued and in a short distance a ledge was struck heavily impregnated with iron pyrites. After boring into this for a distance of fifteen feet, it was determined to make an assay of the rock. The result is reported to have been three ounces of gold and twenty-eight ounces of silver per ton.

MINING ON THE NORTH FORK.—Lewiston *Teller:* As it looks now, considerable mining will be done next season on the North Fork of the Clearwater. Quartz and placer claims were located this year, that prospect well to encourage outlays in time and money for development and active operations.

In the desultory and promiscuous prospecting in the Clearwater basin, for thirty years past, the North Fork region has either been skipped altogether, else the hunt for mineral deposits has been superficial and hasty. This is not to be wondered at, when account is taken of the rugged character of the country drained hy the North Fork. With pack and saddle it is difficult for other than a good mountaineer to make much progress in travel. Even the best of woodsmea find this too hard a task. The only safe way to explore that region is to go up the stream in a batteau with a cargo of supplies necessary for a campaign. Under such circumstances, branches of the North Fork can be followed and exploration made of the high ridges at the headwaters of the creek. This was the method adopted by a number of parties the present year.

THE HIDDEN TREASURE.—The last cleanup at the Hidden Treasuro mino in Neal district, in Idaho, amounted to $2475, the result of one week's run in the five-stamp mill. The Mountain Home *Republican*, referring to the mine, says: "As greater depth is attained on the ledge tho ore improves in quality; the pay oro is three feet wide and is of a uniform grade. This mino, in tho near future, will prove itself to he one of the best paying properties in Idaho. The mine has already produced over $8000, and is steadily producing every day.

CŒUR D'ALENE DISTRICT.—There is nothing that could speak in stronger terms for the value of the Cœur d'Alene district as a good mining country than the fact that at the present time several mines are working successfully in the face of the low prices of silver and lead, and paying all underground employos—miners and shovelers alike—$3.50 a day.

Amoug the mines that are now operating in the Cœur d'Alenes are the Poorman, the Tiger, the Standard, tho 'Frisco, the Gem and tho Morning, while the big Bunker Hill & Sullivan would be had it not been for the strike among the employes that caused it to close its works. The well-known improved mines that are not working are the Black Bear, the Granite, the Custer, the Union, the Hunter, the Last Chance, the Sierra Nevada and the Stemwinder. There are many small mines besides and a host of them that are almost entitled to wear the name of "a mine," but which lack some development or shipping facilities, and on which work stopped when silver and lead first slumped. Some of the acknowledged mines that are now idle are good properties that were mismanaged, either in failure to keep development work sufficiently ahead to insure a good body of ore, or hy attempting to use machinery that wasted the time of the men. Nothing proves this more than the fact that during the past year mines that have been working have, even in the face of the hard times, put in more improved machinery, and those that have not done so are arranging to do it during the present winter. In other words, it has been demonstrated that even with low prices the mines of the Cœur d'Alenes can be successfully operated when good facilities are afforded and the latest improved machinery used.

MONTANA.

Inter-Mountain: The Moscow mine has been started up hy the Parrott Company after quito a longthy shut-down. A small force of men will at first be employed, but it is understood that the Parrott Company will open up this property on a large scale soon. The water will be pumped out hy the Oro Butte shaft, the adjoining claim on the west. This property was purchased some years ago hy this company and considerable high-grade ore has been shipped from it.

The Revenue Gold Mining and Milling Co. has been reorganized, with a capital stock of $1,000,000, hy John P. Alhro, Samuel Newhouse and Louis A. Dunhar. The company will work the Revenue mine, an old-time rich gold producer of Madison county, formerly under the management of R. B. Turner. The company will also probably secure the Revenue mill, which has been held for some time by Butte parties, and resume the treatment of ore by the cyanide process, this mill heing the first in the State to use this process.

THE CLINTON.—It is reported that the Clinton mine, in Park canyon, will soon be in operation again hy a new company, which will, it is said, build a concentrator at this property. The erection of a mill would be a paying proposition, it is helieved, as large hodies of copper-silver ore can be mined from the tunnel at small expense. There is an ahundant water supply in the vicinity for this purpose.

WILL RESUME OPERATIONS.—The good news has been in circulation during the past week to the effect that some of our mines and mills, which have been idle for months, would soon he started up again, says the Phillipsburg *Mail*. Upon investigation the *Mail* has found it to he a fact. The Bi-Metallic mine will be started up and the ore will he worked in the Rumsey mill, for a time at least, until things can be gotten in shape at the Bi-Metallic mill. Forty stamps will he immediately put in condition for work. It is said that it is hardly prohable that the mill will he in shape to hegin operations much hefore the first of next month. The ore from the Bi-Metallic mine will necessarily have to he hauled to the Granite tramway, when it will be transported to Rumsey hy the train. The Bi-Metallic mill will continue to run on tailings, though it is said that several changes in its construction will he made.

NEVADA.

RICH GOLD DIGGINGS.—Winnemucca *Silver State:* Near Death Valley in Tule Canyon, this State, some rich gold mines should he opened. In this canyon rich dry diggings were discovered some fifteen years ago. In 1880 a few men were at work there. They had no machines for dry washing, and did not even winnow the dirt hy tossing it up in the wind—Mexican fashion. They simply dug over the ground with picks, collecting such pieces of gold as they happened to see. In this way they made good wages in ground from two to four feet deep. Working in this rude way they fouad one nugget that weighed five pounds, and a very maay worth from $5 to $75. Pieces of gold worth about fifty cents were about the smallest saved working in this way—"hy eye." With water, or even dry washing machines, such ground should have paid immeusely. As all the placers in the great basin region are of local origin. Tule Canyon must cut one or more large and rich veins of gold-hearing quartz.

At present we hear but little about these diggings, though thore is always more or less gold coming from them, which is said to be ground out in arrastras by some of the ranchers living in the vicinity.

NEW MEXICO.

CARLISLE MINING DISTRICT.—At the Carlisle mining district, which is situated close to the eastern boundary line of Arizona, in Graut county, N. M., a mineral discovery has heen made that promises, in point of magnitude, to be a veritable bonanza. It is a large dyke through which streaks of rich ore, carrying both gold and silver, exist that average $600 to the ton.

North of Phœnix, about fifty miles, on Cave creok, large bodies of ore have been known to exist for years, hut no particular attention had heen given it until recently, owing to the belief that its value consisted mainly in the copper it carried. Recent investigation, however, demonstrates that the copper oxide and carbonates is merely a gangue for both gold and silver in paying quantities. Denver parties recently procured a bond on a group. Capital sufficient to huild a reduction plant and construct mechanical and other appliances for the economic handling of the ores has been secured to open up the claims and to enter into active operations.

OREGON.

BAKER COUNTY.—Huntington *Herald:* Tho *Union-Republican* says there is not a silver mine in Oregon. This is a mistake, frined *Republican*. What do you call the La Bellevue, Monumental, Bay Horse and several other properties in Baker county? These are not only silver-hearing lodes, hut they have proved to he rich in the precious white metal and, but for outrageous goldhug legislation, would to-day be operating profitably and giving employment to scores of hardy miners.

WASHINGTON.

TOO MUCH WATER.—The rise of three feet in the Similikameen river has put an end to plncer mining this year, says the Loomiston *Journal*. Considerable gold has been taken out, and the miners along the banks and bars have made gruh and more besides, but the exceptionally high water of the early part of the season and through August gave the patient fellows too little time in which to get their wing dams into position. With a snowfall this winter and a quick thaw next spring, there will be extensive placer operations next year on the Similikameen, hut the past season was one of the worst in the history of placer mining.

SOUTH DAKOTA.

GOLD PRODUCTION.—The Black Hills, it is estimated, have produced $100,000,000 of gold during the past eighteen years. Of this vast amount, $50,000,000 to $55,000,000 is credited to the Homestake mine alone, which is claimed to be the greatest gold mine in the world. It was sold hy the original discoverers, two Frenchmen, brothers hy the name of Manuel, to the late Senator Hearst of California, for $45,000. Its ore is low grade, running only from $2.50 to $10, hut the amount thereof is practically unlimited. The vein in places is 400 feet thick. Seven hundred men are kept husily at work night and day in its shafts, tunnels and levels. The superintendent's report for the fiscal year ending June 1, 1894, shows the total net proceeds to have been $1,489,961.18. Of this $1,373,669.35 was from hullion, $17,944.27 from concentrates and $99,350.56 from other sources. The disbursements aggregate $1,162,744.55. Of this amount $311,499.63 was paid out for labor and $181,250 in dividends to the stock holders. For the purchase of mining properties during the year $103,780 was expended. The item of taxes foots up $20,012.74; $6,403.25 represents the cost of candles, while the item of powder foots up to $38,879.67. The company started the new year with a comfortable balance of $327,216.72 cash on hand. An eight years' supply of ore was estimated to he in sight. The report applies only to the Homestake mine and mills, and does not include the Highland, Caledonia, Deadwood, Terra, Farther de Smet, and other properties which are generally included under the name Homestake. The Treadwell mine, on one of the Alaskan islands, is rated as a possihle rival to this immense property.

UTAH.

THE AJAX MINING CO.—The properties of the Ajax Mining Company, recently organized for the purpose of working the Champlain and Copperopolis, are to be equipped with modern hoisting machinery, and immediately following the putting in of the machinery, negotiations for the purchase of which are now on, the shaft of the Phœnix will he sent down another hundred feet. From that point a drift will he run into the ground of the Champlain, which is about sixty feet distant from the shaft. At present the latter property is heing worked through the Phœnix by means of a skip, and the members of the company are desirous of seeing more extensive development work done. Some very rich ore is heing taken out, and it is said that the ore hodies are rapidly increasing in size. Up to date power drills have not been used in any of the properties of the group, hut the company will at once put in an air compressor, with the necessary hoiler and engine and a full complement of drills.

NEW GOLD PROCESS.—*Tribune:* E. T. Bradford is here to revolutionize the handling of low-grade gold ores and recently visited Bingham to inquire into the characteristics of the deposits in that locality. The process is the "Pickett-Marshal gold process," and for more than a year has been subjected to rigid tests with results so gratifying that he now guarantees to save the shipper ninety-five per cent of the value of his ores as determined by fire assays. It is especially designed for the handling of silicious and oxidized ores, although it may he so adjusted as to handlo the sulphides. To determine the question as to its adaptability to tho ores in that locality, he will make tho test on carload lots in Denver, where he is handling at the present time thirty tons a day. Once demonstrated that it will apply to the low-grade gold ores of Utah, says Col. Bradford, this Territory will at once double its present productions. A superficial inspection of the ores he saw yesterday at Bingham has satisfied him of his ability to save ninety-five per cent of their contents aud shipments, for experimental purposos will begiu next week. The success of the experiment means a big plant for Salt Lake.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOV. 27, 1894.

529,849.—CAN OPENER—Jos. Bien, S. F.
529,855.—CLOTH LAYER—E. Elossser, S. F.
529,790.—ADDING MACHINE—H. B. Martin, Chino, Cal.
529,836.—ELECTRIC RAILWAY—L. C. Pressley, S. F.
529,814.—BRIDLE BIT—R. A. Shute, San Diego, Cal.
529,875.—CAN-BODY MACHINE—W. H. Smyth, Berkeley, Cal.
529,817.—FRUIT PITTER—S. Standish, Gridley, Cal.
529,987.—TRAINING APPARATUS—S. B. Whitehead, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONDUIT ELECTRIC RAILWAY.—Leonidas C. Pressley, San Francisco, Cal. No. 529,836. Dated Nov. 27, 1894. The object of this invention is to provide a means for conveying an electrical current through completely insulated and protected conductors, which are especially adapted for use for underground conductors from which a current is to be taken for the purpose of driving cars upon railways, and my device provides for the transmission of this current from the conductor to the car at regular intervals, the current being cut off at all other times and points. It consists of a trolley rail extending in an underground conduit, near the slot, through which connection is made between the motor on the car and this rail. This trolley rail is made in independent insulated sections. An electrical conducting wire extends, in a hermetically sealed tube, parallel with the line of track, and passages are formed connecting the tube with the conduit at the junction of each two sections of the trolley rail. A rod is slidable in each of said passages, having at one end an electro magnet which, when energized, acts to draw the rod into contact with the rail, and at the other end a device whereby the contact is made between the rod and the conducting wire so that the trolley rail section may be charged therefrom, and a mechanism whereby the magnets are disengaged and the rods moved hackward after the car has passed, whereby the rod is disconnected from the conducting wire and rail and the current is cut off from the preceding section as the car enters the next section.

BRIDLE BIT.—Richard A. Shute, San Diego, Cal. No. 529,814. Dated Nov. 27, 1894. The object of this invention is to form a rigid connection between the ends of the har which passes through the horse's mouth, whether it be a rigid or jointed har, whereby the rings are prevented from pulling into the mouth of the horse from either side, and they also furnish a fulcrum through which a pull upon the reins on either side will be communicated through the body of the bit, providing a leverage against the jaw of the horse, and enabling the driver to turn him equally as well as preventing him from holding the bit hetween his teeth. It consists of a mouth bar, the outer ends of which are enlarged and have rings formed upon the ends which hold against movement, so as to he rigid with the mouth har, said rings diverging and being provided with means for attaching the driving reins, and also having the upper sides provided with slotted openings for the reception of the head stall strap.

CAN OPENER.—Joseph Bien, San Francisco, Cal. No. 529,849. Datcd Nov. 27, 1894. This invention is designed to provide an apparatus for opening cans by means of a horizontal cut made around the side of the upper portion of the can, just helow the top. It consists of a hase having a socket at one side; a standard mounted to slide in said socket having its upper end turned inward and provided with a plate or head adapted to engage the top of the can, and also provided with means for centering and holding the can; a swiveled arm movable about the common center of the can and the holder; a cutter slidable radially upon said arm and carried theroby, so that when the arm is moved around in a circle, the cutter will act to sever the metal of the can side. In conjunction with this is a hase having a series of offsets of varying diameters adapted to receive cans of different sizes.

Electrical Progress.

A New Electrical Smelting Process.

The new Taussig electrical smelting process, which is now passing through the experimental stage in Germany, gives exceptional promise, and, should its practical test prove satisfactory, it will modify recent electro-metallurgical developments, progressive as they have been, to a remarkable extent. The process consists in first reducing and smelting the ore, and then casting the metal. Both processes are carried on in a vacuum. The refraction of the air has the effect of removing all bubbles of gas or air, and the casting is thoroughly homogeneous. The apparatus consists, essentially, of a long, air-tight smelting chamber, in which the hearth inclines toward a central opening, through which the metal passes into the mold. The chamber is packed with ore and flux, or metal, as the case may be, and the furnace is lined with glazed firebricks, which so thoroughly insulate it that there is no escape of current. Within fifteen minutes of the turning on of the current the heat developed will melt pig iron, and it takes but little longer to melt Siemens-Martin steel. As no carbon is present the fused metals are almost pure; oxidation or blistering, and the deleterious effect of gases evolved are prevented by the rarefied atmosphere, and the castings produced are dense and homogeneous. The most obvious advantage claimed for this process, in the smelting of raw ores, is that it can be worked wholly by water power. This ability to dispense with fuel is a matter of great moment in mountainous and remote ore-producing districts which have abundant water but no coal. In the fusing of iron it is claimed that the operation is rapid and amenable to continuous working; that it improves the quality of the castings, and that, even where steam power is used to generate the current, it gives a saving of thirty to fifty per cent in fuel. The practical limit of the process, as at present organized, would appear to be the handling of about one and a half tons of metal in one charge, which would require a furnace or fusion channel of from thirty-six to forty feet in length. By applying to such a furnace a current of 30,000 amperes and 50 volts, or say about 2000 horse power, the entire charge of 3000 pounds can be fused and run into castings in a quarter of an hour. In the making of steel and iron castings by smelting in a Siemens-Martin regenerative furnace, 1000 to 1400 pounds of coal are burned to smelt 2000 pounds of iron. In the Taussig process, even assuming that water power is not available, and that the dynamo and air pumps must be worked by steam, it is claimed that the smelting of 2000 pounds of iron or steel can be effected by the consumption of from 720 to 800 pounds of steam coal, an economy of nearly fifty per cent in fuel. Where the steel is treated in crucibles the economy is still greater, especially if the coal used be of inferior quality. By means of this process, it is stated, pig iron containing under three per cent total carbon has been produced, and it is believed that, where desirable, the carbon limit can be brought down to that of steel. It is estimated that a plant equipped with 500 to 600 horse power, using a good quality of 48 per cent ore, can produce pig iron for $8 to $9.50 per ton, allowing $2.40 for the cost of ore. Certain plants in the South already turn out iron at a lower cost than this, but the figure can be greatly reduced where a water power is available for the generation of electric current. If this system can be put on a commercial basis, it will be most valuable for the treatment of ores in the neighborhood of water power, or even where water power exists near enough to permit of the cheap transmission of current, fuel being presumably high-priced.

An electric poultice has been invented by Mr. Snedekor, involving no novel principle, but a new and useful application of an old one. It consists of an arrangement of bad conductors covered with a fabric. By sending a current through this cataplasm it may be raised to any desired temperature, which remains constant so long as the current is allowed to pass.

Conversion of Steam Power into Electrical Power.

Some weeks ago it was announced that Nicola Tesla was perfecting a device of some kind of a revolutionary character in electrical development. It is now reported in one of our exchanges that he has inveuted what he styles an "oscillator," which directly converts steam power into electrical power without the interposition of the dynamo. In the high-pressure steam engine which he employs, said to be of simple and cheap construction, the piston action directly excites the magnets, which in turn control the very rapid vibration of the piston, and electric current is produced in quantity varying with the power of the machine, without any of the losses by friction and radiation incidental to the existing methods of combining the steam engine and the electric dynamo.

The benefits to be derived from the use of this invention, it is said, include not only a cheapening of production by the leakages thus saved, but also a considerable cheapening of the cost of plant. The total cost of production, it is expected, will be reduced one-half.

Should the expectations of this daring inventor, as thus outlined, be realized, a tremendous impetus will be given the development of electricity as a mechanical power producer, and it would also largely extend the use of electricity for light and heat, perhaps to the exclusion of all other agencies from these fields. The ideal invention among electricians, at present, is the conversion of the energy stored up in coal directly into electricity without the interposition of steam at all, and hundreds are working at the problem, though, as far as known, with no immediate prospect of success. Could the means for this direct transformation of energy be discovered, one ton of coal would do the work of seven. But while the world is waiting for the electrician to solve that momentous problem, it would not be averse to the adoption of an improvement which cuts down coal bills only one-half instead of six-sevenths.

Greatest Inroads of the Motor.

It is said that the two fields in which the electric motor has of late made greatest inroads are those of mining and of iron manufactures, and that in these the developments compare in importance, if not in magnitude, with the advances in electric railroading. In mining there is a great range of application, including underground tramways, elevators, pumps, ventilators, drills, coal cutters, etc., and all branches are being actively exploited. A large quantity of American electrical mining apparatus finds its way to South Africa, and a brisk demand is now springing up in the eastern world. In iron and steel works throughout this country the resort to electrical power is remarkable. Large numbers of them use electrical cranes, and electrical power distribution plants may be found in the great manufacturing plants of the country.

Small electric batteries, weighing about half a pound, will probably soon be added to the equipment of the German soldier. The current will light a small lamp, which may be fixed in the helmet when night work has to be done, and the device will also be useful to men employed about powder magazines.

In Australia horses and cattle are now branded by electricity from storage batteries. The temperature is uniform and the brand safe and artistic.

Spokane, Wash., proposes to invest $40,000 in a 200-light plant.

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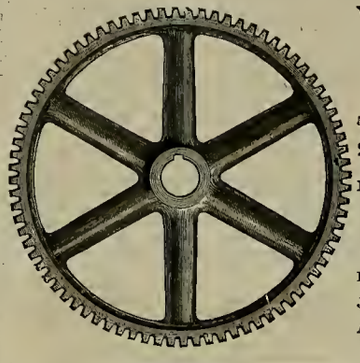

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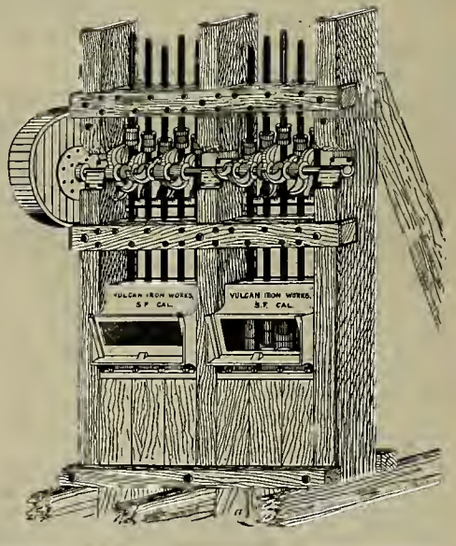
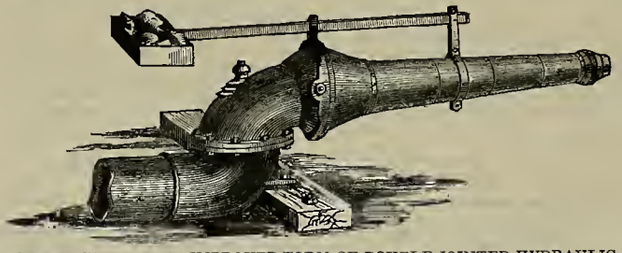


IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

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Practical Information.

The Efficiency of Centrifugal Pumps.

The results of some experiments on the efficiency of centrifugal pumps recently made on the Continent have been published in the *Mechanics' World*, and are of interest as indicating how frequently the conclusions arrived at theoretically require modification in practice. The design of the pump was such that the discharge through the wheel casing was taken through a narrow orifice extending around the entire circumference of the casing. This orifice gradually widened outward, to allow the water to arrive without shock in a spiral collector surrounding the pump and leading into the discharge pipe. The width of the orifice was such as to give the required flow at the velocity due to the head against the pump, with an allowance of 0.6 for contraction. The maximum mechanical efficiency of the pump was found to be only fifty-eight per cent, and occurred only with the greatest flow—about 5.4 gallons. The maximum efficiency for any given rate of delivery occurred when the lift was between fifty and sixty feet. Another pump was constructed after these trials, in which the form of the blades and of the casing was altered from that first adopted, and with this pump an efficiency of sixty-five per cent was obtained, with a discharge of 6.6 gallons under a head af 65.6 feet, and an efficiency of sixty-eight per cent with a discharge of 7.8 gallons under a head of 32.8 feet.

THE latest engineering scheme relative to the Panama Canal is that put forth by M. Bartissol, who proposes to get along with four locks—two at each end of a central level only seventy-five feet above the ocean—instead of the old plan of several levels, and from eight to ten locks between 122 and 175 feet above the sea. As this would involve an increased amount of rock and soil cutting, he proposes to dispose of the extra material thus excavated by constructing a thirteen foot tunnel, some 30,000 feet in length, through which the debris will be washed, water for which purpose to be brought through an open channel from a dam on the Chagres river—that is, there would be allowed a fall of about one foot to every 1000 of length, the current filling the tunnel to a height of some ten feet, a flow of ten feet per second, it is estimated, being thus secured, which would discharge 1,000,000 cubic meters daily; 100 shafts cut into this tunnel would empty into it only about 40,000 cubic meters of solid material in twenty-four hours, so that only about four per cent of the discharged mixture would be earth or stone. This method of removing debris, it is further remarked, has already been tried on a much smaller scale at the Isthmus and elsewhere.

THOMAS SMYTH of Fredericktown, Mo., has this idea: If shingle nails were stuck into a strip of paper, crosswise, as pins are arranged in a paper of pins, and this strip were reeled and carried in the pocket, much time could be saved in driving nails when a man was shingling a roof. The gain would be in not having to fumble about so much to straighten the nail up before driving, and in not having to carry the hand back to the pocket each time. He thinks the work of inserting the nails in the strip could be done by machinery. If anybody sees money in this idea, Mr. Smyth would be willing to sell it.

METALS may be given a soft bronze color by applying with a brush a mixture of bloodstone and graphite. The antique green effects often seen are produced by dipping the metal into a solution of salt, cream of tartar, acetate of copper, soda and vinegar.

HIRAM S. MAXIM'S flying machine is the strongest moving thing for its weight in existence. Its engine and boiler together weigh only a little over five pounds for every horse power developed. An ordinary locomotive weighs over 100 pounds to the horse power, a light yacht engine about the same, a bird twenty pounds, and a good draught horse from 1500 to 2000 pounds.

THERE is a diversity of opinion here and abroad in regard to the commercial value of electric storage batteries. They are considered successful in Europe, while the opposite view is generally held in this country. The reason of this is probably that on the other side, where people are more conservative, the batteries are given a better chance and too much is not expected of them. Here we drive them too hard on account of the keen business competition. A storage battery cannot be worked continually at its rated capacity and live.

A VERY clever device to prevent accidental poisoning by taking medicine from the wrong bottle is worth mentioning for its very simplicity. A small bell is attached to the cork of the poison bottle and rings at the slightest motion. As a considerable number of deaths each year are due to this very cause, the adoption of this little safeguard might prove very valuable.

A LENS, which will be when finished the largest in the world, is now being cast at Jena, Germany. It is an objective for an astronomical telescope and will be 43½ inches in diameter, about five inches greater than that at the Lick observatory. In its rough state, before grinding, it weighs just a ton, and will cost, it is estimated, about $75,000.

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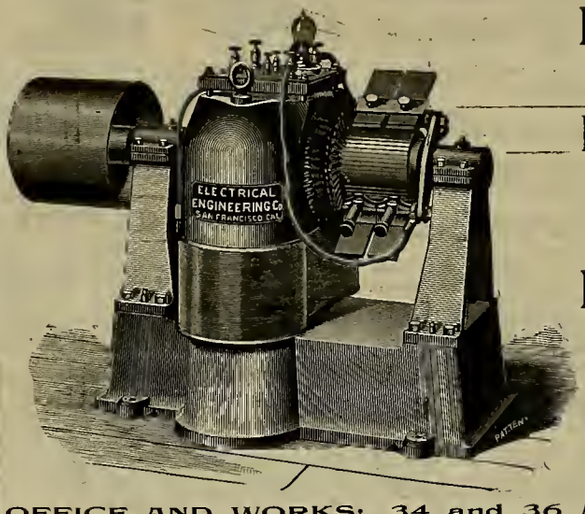

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Market Reports.

The Markets.

SAN FRANCISCO, Dec. 6, 1894.

Lower and lower goes the price of silver, the latest quotation being almost to the lowest notch reached on the 23d of last February, when it fell to 59¾. The silver market bas been in a state of collapse during the week in London, tbe cause being ascribed to tbs recent large purchases by Japan of war material, for whicb Japan is said to be creating bills on the East, thus diminishing otber forms of remitting. In this country the President's message, where be recommends the extension of the bank currency system and altogetber ignores the silver question, is considered to add largely to the depression. It is a long lane, but it has a turn and the white metal will yet prevail in price.

New York Prices.

NEW YORK, Dec. 6.—Following are tbe closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	28⅝	62¼	9 50	3 10
Saturday	28⅛	62⅛	9 40	3 12½
Monday	28⅜	61⅝	....	.....
Tuesday	28⅛	50⅞	9 50	3 10
Wednesday	27⅞	60¾	....	.....
Thursday	28⅛	61¼	....	.....

Tbe local bullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prims, taxss paid hy lsndsr	7
New York Sight Draft	Par
New York Telsgraphic Transfsr	5c
London Bankers' 60 days	$4.87¼
London Merchants	$4.85½
London Sight Bankers	$4.87½
Refined Silver, per ounce	60
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6⅝
Powdered, "	—	@	6⅝
Concentrated, "	—	@	6¼
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 50	@	5 60
IRON.			
American Soft	14 00	@	16 00
Pig, psr ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Psr lb	16¾	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	4
Bar	—	@	4½
Sheet	—	@	5¼
Pips	—	@	4¾
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lbs			$1 25
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trads, psr flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			7 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			9 00
Wallsend			7 00
Scotch Splint			6 00
Brymbo			7 50
West Hartley			6 75
TO ARRIVE—PER TON.			
Australian	5 62	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 37½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in hulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

San Francisco Stock Board Sales.

SAN FRANCISCO, Dsc. 6, 1894.

9:30 A. M. SESSIONS,

200 Alta	02	200 Kentuck	02
50 Best & Belcher	62	300 Mexican	59
50	61	100	58
500 Bulwer	06	100 Ophir	1 70
100 Challengs	36	200 Overman	10
100 Con Cal & Va	3 35	100 Potosi	40
200 Crown Point	51	200 S B & M	17
300 Hals & Norcross	90	100 Union	32
100 Justice	25	200 Yellow Jacket	43

SECONN SESSION—2:30 P. M.

300 Alta	21	100 Hals & Norcross	91
300 Belcher	65	100 Justice	23
200 Bodie	55	400 Ophir	1 75
100 Chollar	50	300	1 70
100	51	300 Mexican	60
100	52	100 S. B. & M	17
100 Crown Point	55	100 Union	36
25 C. C. V	3 55	200 Utah	07
300	3 50	100 Yellow Jacket	46
Gould & Curry	40	100	48

ANNUAL MEETING.—THE REGULAR ANNUAL meeting of the stockholders of the Gould & Curry Mining Company will be held at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal., on MONDAY, the 17th day of December, 1894, at the hour of 1 P. M., for the purpose of electing a Board of Trustees to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, December 14, at 3 P. M. ALFRED K. DURBROW, Sec.

Mining Share Market.

SAN FRANCISCO, Dec. 6, 1894.

Matters on tbe Comstock are looking up, but tbat is of little import to Pine street, where matters are looking down, there being little business and a general decline during tbe week. It has become a good deal of a tencent business, and in size bears the same relation to former transactions that a sardine does to a whale. The moment a stock goes up a few cents, some of those wbo "despise not the day of small tbings" let go for tbe few dollars in sight, and down it goes again. Tbe Con. Va. bas paid a 25c-per-share dividend, amounting to $54,000, tbe first since August, '91. Since its consolidation witb the California, the company has paid 37 dividends, amounting to $3,682,000. Before that tbe California paid 34 dividends, amounting to $31,320,000, and the Con. Va. 53, amounting to $42,930,000. Tbe two mines to date have paid 124 dividends, aggregating $77,932,000.

The Bodie-Standard Con. will pay its 86th dividend on the 20th.

The following shows the cash balances of some of the mining companies last Monday:

Alpha	$3,379	Julia	$105
Alta	881	Kentuck	1,137
Andes	11,601	Lady Wash'n	2,756
Belchsr	20,879	Mono	102
Best & Belcher	2,405	Mexican	3,466
Bullion	8,692	Nevada Queen	866
Bulwer	1,365	Occidental	502
Bodis	41,507	Ophir	6,744
Caledonia	4,735	Overman	2,732
Challenge	331	Potosi	8,849
Chollar	11,575	Savage	583
Con. New York	1,603	Scorpion	1,681
Confidence	1,874	Seg. Belcher	2,701
Con. New York	2,368	Silver Hill	859
Con. Cal	175,495	Sierra Nevada	11,615
Crown Point	11,420	Standard Con	61,070
E. Sierra Nevada	238	Syndicate	894
Exchequer	3,824	Union Con	3,839
Gould & Curry	7,566	Utah	3,451
Hale & Norcross	7,591		

The indebtedness of other companies on tbat date is reported as follows:

Commonwealth	$14,667	North Belle Isle	$3,348
Grand Prizs	763	N. Commonwsalth	28,807
Navajo	365		

The pay rolls of tbe Comstock corporations for November amounted to $80,817.60.

Coast Industrial Notes.

—Tbe Joshua Hendy Machine works have bought tbe plant of the Vallejo, Cal., Electric Light Co.

—The Street Railway and Electric Light Company of Vancouver, B. C., has been sold to an English syndicate.

—The Chino ranch, San Bernardino county, 41,000 acres, has been sold to Charles Philipps, of San Luis Obispo, for $1,500,000.

—A cable from Point Reyes to the Farallones is urged. The distance is eighteen miles; the cost would be about $1500 a mile. It is necessary and should be built at once.

—A grain dealer in Baker City, Or., is holding a million pounds of grain, including fifty tons of wheat, believing that an increase of price is certain. He is still purchasing.

—The big South Gila, Arizona, canal, on which balf a million dollars bave been expended, is expected to revive shortly. Bonds are now in New York witb good prospects of being taken.

—A well in Adams canyon, Ventura county, belonging to the Union Oil Company, since it was put down four years ago bas produced over 325,000 barrels of oil, netting the company $43,000.

—A ship loaded with flour from Wasbington will soon leave Seattle for Japan. It is also probable that anotber ship loaded witb tbe products of that State will leave Seattle for Central America before long.

—All the canneries on Puget sound and tbe Columbia river bave closed down for the winter. Tbe catcb this year is greater tban that of any year previous. The market is good and most of tbe canneries bave made money.

—Tbe Crocker Estate Company bas a contract witb Eastern people to plant 2000 acres at Merced in sugar beets. Dr. Koebig has agreed to put up a $100,000 beet-sugar factory at Merced to utilize tbe beets. It is estimated that the beet crop tbe first year will be worth $84,000.

—Tbe work on tbe first section of the canal being built by the California Waterworks and Irrigation Company in Inyo county, is progressing favorably. Frederick Stock, Chief Commissioner, has received an offer for tbe purchase of 6000 acres of the company's land at $10 per acre.

—Tbe Fresno Milling Co. bas brought suit against the State to recover $490,000, which tbe plaintiff alleges is due it for damages resulting from the destruction of its water power by the State authorities. Tbe complaint alleges tbat the State filled in tbe company's ditch.

—Tbe Kings River Lumber Co. bas a large order from Germany to get out sequoia lumber for lead pencils. It is said tbat wood suitable for lead pencils is practically exbausted in otber parts of tbe world and tbat California stock will be largely drawn upon for this purpose in the future.

—An English syndicate has contracted to build the Fraser Valley & Burrard Inlet railway, fifty-one miles long, from Sumas, Wash., to Vancouver, B. C., providing tbe city of Vancouver gives tbe promised subsidy of $550,000 and grants an extension of one year's time, or to December 31, 1895, in whicb to build tbe road.

—Tbe following companies have filed articles of incorporation:

California Paint Company. Principal place of business, Los Angeles. Capital stock, $20,000, with tbe following directors: G. S. Foster, Colin Shanks, George F. Lott, William R. Bentley, Los Angeles; Ferd K. Rule, Pasadena.

California Shoe Company. Principal place of business, Oakland. Capital stock, $5000, with the following directors: A. L. Bryan, Napa; O. J. Cline, M. S. Hewes, Oakland; T. M. Earl, Anita Earl, San Francisco.

American Watch Company. Principal place of business, San Francisco. Capital stock, $1,000,000, witb tbe following directors: Cbarles Bovone, Percie H. Coward, A. H. Ste Marie, F. Spangenberg and G. DeLuca, San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

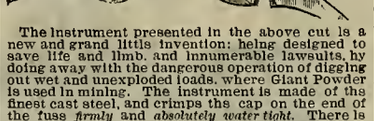
ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delin'q and Sale.		Secretary.
Alpha Con, Nev	13	10c	Oct 30,	Dec 3,	Dec 21	C E Elliot, 309 Montgomery
Alta S M Co, Nev	48	10c	Nov 28,	Jan 3,	Jan 24	J E Jacobus, 309 Montgomery
Best & Belcher M Co, Nev	57	25c	Nov 12,	Dec 18,	Jan 8	M Jaffe, 309 Montgomery
Challenge Con. Nev	17	5c	Oct 31,	Dec 4,	Dec 27	C L McCoy, Mills Building
Gray Eagle M Co, Cal	38	5c	Nov 12,	Dec 14,	Jan 11	C C Harvey, 309 Montgomery
Hale & Norcross, Nev	106	25c	Nov 23,	Dec 29,	Jan 23	A B Thompson, 309 Montgomery
Justice M Co, Nev	57	5c	Nov 2,	Dec 6,	Dec 27	R E Kelly, 309 Montgomery
Kentuck Con, Nev	72	10c	Nov 14,	Dec 19,	Jan 9	G D Edwards, 414 California
Mexican G & S M Co, Nev	51	25c	Dec 5,	Jan 8,	Jan 29	C E Elliot, 309 Montgomery
Mono G M Co, Cal	34	15c	Nov 19,	Dec 27,	Jan 21	M E Willis, 309 Montgomery
Occidental Con, Nev	17	5c	Nov 1,	Dec 4,	Dec 27	A K Durbrow, 309 Montgomery
Overman S M Co, Nev	72	10c	Nov 14,	Dec 19,	Jan 9	G D Edwards, 414 California
Quincy M & W Co, Cal	1	20c	Oct 31,	Dec 11,	Jan 4	W C Ralston, Mills Building
Silver Hill, Nev	34	5c	Nov 19,	Dec 26,	Jan 16	D C Bates, 309 Montgomery
Starlight M Co, Nevada	3	10c	Oct 10,	Nov 19,	Dec 10	H H Williar, 321 Pine
Union Con S M Co, Nev	50	20c	Nov 22,	Dec 27,	Jan 16	C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Andes S M Co	J W Twiggs, 309 Montgomery	Dec 18
Champion M Co	J F Holling, 113 Crocker Bldg	Dec 14
Gould & Curry M Con	A K Durbrow, 309 Montgomery	Dec 17
Kentuck Con M Co	A Waterman, 309 Montgomery	Dec 19
Wyoming G M Co	W J Gurnett, 308 Pine	Dec 17

GIANT POWDER FUSE CAP FASTENER.



The instrument presented in the above cut is a new and grand little invention: being designed to save life and limb, and innumerable lawsuits, by doing away with the dangerous operation of digging out wet and unexploded loads, where Giant Powder is used in mining. The instrument is made of the finest cast steel, and crimps the cap on the end of the fuse *firmly* and *absolutely water tight*. There is also a Fuse Cutter attached. **Price 75c. each.**

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DELINQUENT SALE NOTICE.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the 26th day of October, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amount.
W. T. Rohinson	7	25,000	$1,250 00

And in accordance with law, and an order from the Board of Directors, made on the 26th day of October, 1894, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 55, No. 309 Montgomery street, San Francisco, California, on THURSDAY, the 27th day of December, 1894, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. STADTFELD, JR., Secretary.

Office, Room 55, No. 309 Montgomery street, San Francisco, California.

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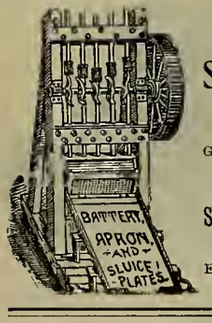

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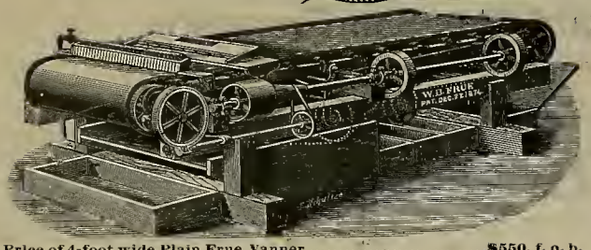

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GLADSTONE MINING COMPANY, FRENCH GULCH, Shasta Co., Cal.,
C. J. Clark, M. E., Gen'l, Supt. Dec. 12, 1891.

MESSRS. ADAMS & CARTER, San Francisco, Cal.—DEAR SIRS: During my experience in mining and milling, I have used twenty-four of your four-foot Frue Vanners on different kinds of ore, both gold and silver. I have made competitive tests against them with other widely puffed-up concentrators and have always found the FRUE in first place. When I built this mill (20 stamps), I determined to put in six-foot Frues in order to save space and machinery. I am now running four of your six-foot machines and they have been going for TWELVE MONTHS. They are taking the pulp from 20 stamps, crushing a minimum of fifty tons per day, and do better work than the four-foot tables. They require no more attention than a four-foot table and handle at least twice the quantity of ore. I have run them up to 80 tons per day and could not see that they were crowded. They stop and start as easily as the smaller tables and have the advantage of double capacity with the same bearings and wearing parts, requiring no more oil, and no more wear and tear than the smaller tables. My repair account for the past six months has been too small to to mention. In order to give an idea of the work they are doing here, I will state that the ore has varied monthly from $5 to $20 per ton and the tailings from nothing to 60 cts. per ton. I will conclude by saying that I cannot endorse the six-foot Frue Vanner too highly, and it is the only table that I would have in my mill.

C. J. CLARK, Gen'l Supt.

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CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
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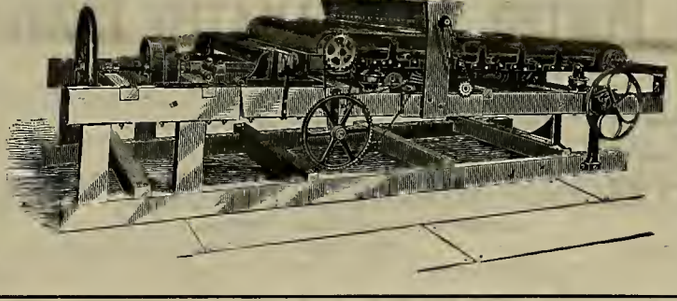

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Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

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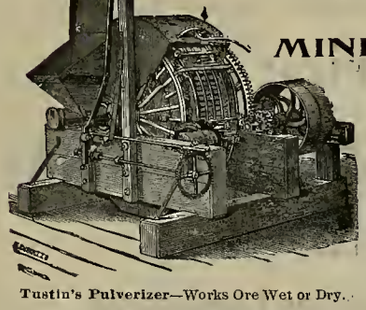

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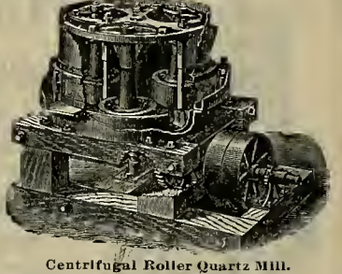

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 24. SAN FRANCISCO, SATURDAY, DECEMBER 15, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Magnetite, Etc., in Black Sand.

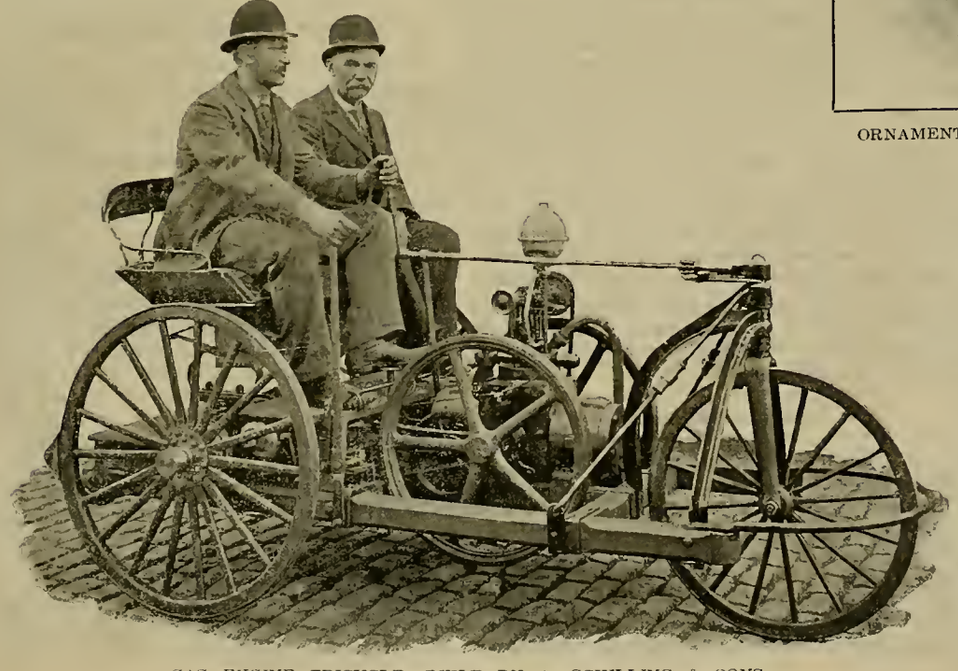
In this issue appears the third and last installment of the article on the gold-bearing sands of California, written by Mr. J. A. Edman. More than ordinary interest is shown in this subject, as evinced by the letters received at this office from all parts of the coast. A portion of these letters refer to the magnetic iron in the black sand and its commercial value. Efforts have been made from time to time to practically demonstrate such value. A large percentage—nearly one-half—of the whole production of iron in Japan is derived from treatment of the magnetic sand, and repeated analyses of the black sand on the California coast shows that it contains from 15 to 50 per cent of magnetite. Magnetite or magnetic oxide of iron, when pure, contains 72 per cent of iron. It is the most important of the ores of iron, and from it, with charcoal as fuel, are produced the finest kinds of iron and steel.

In connection with this may be mentioned a native alloy found in the black sand and sea-beach gold at Gold Bluff and other places on the California and Oregon coast. It occurs in thin scales about one-fiftieth of an inch in diameter, resembling nickel in color. It is strongly magnetic. Its specific gravity is 18. It is composed, in 100 parts, of platinum, 48; osmiridium, 44; iron, 6; indeterminate, 2. This alloy, so far as known, has not as yet been discovered in place. Its geological home is inferred to be in the peridotite and serpentine rocks.

Gas Engine Tricycle.

Verily, the field of usefulness formerly held by the horse is narrowing daily. To steam, electricity and the ubiquitous bicycle comes an ally in the form of explosive gas, so cunningly applied to the propulsion of vehicles as to threaten his utter rout. The accompanying illustration shows the latest improvement in adapting the gas engine to the running of wagons on ordinary roads. This tricycle is propelled by a 2 H. P. Golden Gate balanced gas engine. It has been tested on the streets of the city under varying conditions as to grade and roadway, and has proved in every instance satisfactory, being easy to control as regards starting, regulating speed, turning, stopping, etc.

The machine is calculated to carry three persons on the single broad seat, though operated by one, with surplus power sufficient to trail one or two buggies or a loaded wagon, according to the character of the road. It carries twelve hours' supply of gasoline, or two and one-half gallons, and can easily attain a speed of from ten to twelve miles per hour on favorable ground. Being geared in such a manner that the movement of alever increases or decreases the speed enables the driver to climb grades of considerable pitch. It is claimed to be perfectly safe and is simple in construction, the design of the inventor being to have as few pieces and parts as possible. The wheels and frame supporting the engine are strong and the entire machine is constructed in the most substantial manner, as if intended to withstand hard usage. It was built on an order from a gentlemen in Santa Maria, California, by A. Schilling & Sons, 211-213 Main street, manufacturers of the Golden Gate gas engine.



GAS ENGINE TRICYCLE, BUILT BY A. SCHILLING & SONS.

AUSTRALIA, Africa and the Phillippine Islands being big gold producers, another quarter of the world is heard from. It is said that Corea, the present bone of contention between China and Japan, is rich in gold, and that the ignorant and untrained Coreans have for years been digging out gold with soft iron instruments, detaching the decomposed quartz and crushing it by rocking boulders on it. If one-half reported is so, Corea's gold yield could be made an important factor in the world's annual gold output.

ORNAMENTAL ARC LAMP FOR INCANDESCENT CIRCUITS.

Ornamental Arc Lamp for Incandescent Circuits.

Above is illustrated an ornamental arc lamp for incandescent circuits, made by the Electric Construction and Supply Company, 18 Cortlandt street, New York City, constituting a handsome addition to the fittings of a room. The mechanism of the lamp is so simple as to obviate annoyance in daily—or nightly—use. They burn from 7 to 14 hours, have universal carbon holders with a range of $\frac{5}{16}$ to $\frac{5}{8}$ of an inch, and hung in an office constitute a thing of beauty and a joy for—a long time.

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J. F. HALLORAN.....General Manager

San Francisco, December 15, 1894.

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A BILL has passed both houses of Congress authorizing the entry of land for gravel pits and reservoir purposes, and granting right of way for pipe lines. Under this law any citizen or ditch or water company may buy lands for reservoir purposes, not to exceed 160 acres of unoccupied lands, at not less than $2 per acre. When lands so purchased are in a mining district they are considered mineral lands, and the patents do not authorize the purchasers to extract mineral therefrom, but reserves it to the United States. Any State, county or district organization organized under the laws of a State or Territory may apply for any of the storage reservoir sites not reserved by the United States, situated on unentered public lands, for storage of water for irrigation, mining or other purposes, and this land shall be set aside for that purpose. Non-use of such land for two years constitutes forfeiture. The land must not be within the limits of any public park, or military or Indian reservation.

Another Unjust Ruling.

Extended reference was made in these columns some months ago to the case of the Manzanita mine, and at the recent convention of the California Miners' Association the subject was cited to illustrate the flagrant injustice of the Interior Department in awarding perjured applicants an actual mine in Colusa county, on the unproved claim that it was "agricultural land." During the week as outrageous an abrogation of justice and equity has transpired in the denial by the Secretary of the Interior of a motion for a review in the case of the Duffy quartz mining claim in the Stockton district, on purely technical grounds. In this case, as in that of the Manzanita, it was proved beyond a reasonable doubt that the land was mineral; that the claim was a valuable one; that over $10,000 worth of gold was taken out in the last eighteen months, but despite all this the Department ruled squarely against the facts.

It is because of these long-continued, disbonest rulings that the miners of this State and the entire coast are moving in the matter of making legislation that will give them at least a portion of the rights enjoyed by others before the law; rights that now seem to be denied them, not only by the law itself, but by the strained and biased rulings of officials who, by the irony of circumstance, find themselves in a position to wreak wrong, without present hope of redress on the part of those who have long suffered such wrongs in silence.

Mining Machinery Trade.

Improved methods of mining have called for improved styles of machinery and the rapid development of that industry, or, rather, the awakened interest in gold mining has occasioned inquiry for machinery embodying the most economical processes. The opportunity for the sale of United States mining machinery in other American republics is not fully embraced. European manufacturers of mining machinery have made great efforts to establish trade relations with Mexico, Central and South America, and naturally have influence and control in Australasia and Africa. Eastern manufacturers have sent representatives to the other American republics, Cincinnati and Cleveland men being particularly zealous. In such manufacture California and San Francisco cannot afford to fall behind. The business exists, but what is worth having is worth asking for. The importance of this city as an industrial center suggests the policy of securing this trade, and in this regard it is in order to point out the desirability of co-operation. Such men as President Diaz of Mexico favor an international exposition of mining and other machinery in the City of Mexico. It is believed that such an exhibition repeated in the commercial centers of other of our sister republics, under the auspices of the several governments and the manufacturers of American machinery would broaden the market and be of mutual advantage.

The president of one of the largest companies engaged in the manufacture of mining machinery recently told the writer that had it not been for orders from Mexico he would have been obliged to close his works last July. This illustrates the relative importance of such a market.

Already is felt the good effects of the Santiago exposition, and with co-operation and concentration of effort valuable business that now goes to England could be regained and retained at home.

The programme is an extensive one. It comprises the meeting of manufacturers, the settlement of many preliminaries, and involves a certain amount of politics and legislation, including the restoration of reciprocity treaties, but that intelligent effort in the direction outlined would be of commercial benefit must be manifest to those who have given the subject the most casual notice.

Patent Law Changes.

It is intended, if possible, during the present session of Congress to have passed an amendment of Sec. 4887 of the Revised Statutes, limiting the validity of a domestic patent to the life of a foreign patent. Patent Commissioner Seymour sees no reason why an American patent should not stand upon its own feet and give the same privileges as if foreign patents had not been granted upon the same article. The original purpose of the section was to deprive foreigners who had first obtained a patent abroad from extending their monopoly in the United States beyond the expiration of the foreign patent, to the disadvantage of American manufacturers and consumers, but this feature of the patent laws has become of secondary importance to the effect of the section upon Americans who have obtained patents abroad, and have found their privileges under the American patent laws abridged by the early expiration of the foreign patent. It is thought best that the patentee be required to take out his patent within a short and reasonable time in all the countries in which he desires a patent, and thus prevent his extending his monopoly over a series of terms in different countries, by seeking a patent in the United States or elsewhere long after it had been granted in another country.

A Plan to Impound Debris.

At a meeting of the Executive Committee of the State Miners' Association last Monday night, A. H. Rose, State Commissioner of Public Works, made a report estimating the cost of constructing canals, dams and embankments on the Sacramento, Yuba and Bear rivers to carry the debris thence into the basin of the American river, on the east side of the Sacramento, between the Bear and American rivers, comprising an area capable of holding 1,700,000,000 cubic yards of debris, when filled fifteen feet in depth, which was deemed ample for all possible debris from hydraulic mines in the region embraced for twenty-five years, and would obviate the necessity for building individual impounding dams. Mr. Rose estimates that the work would cost $1,689,749, Congress to make the necessary appropriation; were that withheld, the land in question to be condemned by the State, and the work done by State aid. The proposed dam would be built at Daguerre point, ten miles above Marysville, to retain the heavier matter, the lighter to be carried by canals to the basin. The subject was taken under advisement. In accordance with a suggestion from W. W. Stow, a committee consisting of Messrs. Ricketts, Yale, Wright, Loftus and Hoffman was appointed to confer with Messrs. Mills and Herrin, of the S. P. Co., regarding mineral lands within the lieu railroad grants. The Committee on Protection of Mineral Lands from Railroad Grants made report that in California there are 1,146,500 acres unpatented land, for about half of which patents are pending, and that they had telegraphed the Secretary of the Interior asking that no patents be issued to the railroad company until their side of the case had been presented.

The Suspension of Assessments.

The attention of those who have not yet secured the benefit of the Suspension Act for '94 is directed to the fact that only about two weeks remain, and that by the 31st of this month the claimant or claimants of any mining location, in order to secure the benefits of this act, shall cause to be recorded in the office where the location notice or certificate is filed a notice that he or they intend to hold and work said claim. By so doing they will be exempt from being required to do $100 worth of labor or improvements for the year.

In answer to several inquiries received during the week it is to be noted that the notice must be *recorded*. It will not do to simply "file" it. In some of the counties of this State the clerk or recorder good naturedly makes no charge, and that is in direct line with the idea of the exemption, but if he demands his regular fee it must be paid. It is not necessary to have it acknowledged before a notary. The following, in the absence of anything better, will be sufficient:

NOTICE.

To Whom It May Concern:—Notice is hereby given that .....the undersigned, owner..and holder.. of the..... .....mining claim.., situated in the.....mining district, in the county of....., State of..... being desirous of taking advantage of the Act of Congress, entitled "An Act to Amend Section 2324 of the Revised Statutes of the United States," relating to mining claims, approved July 18th, 1894, do hereby declare that....in good faith intend to hold and work said mining claim..

Witness.....hand.. at....., County of....., State of....., this..... .....day of....., 1894.

Signed, ...
.....
.....

Cleaning Gold Off Copper Plates.

To free copper plates from gold they may be put over a charcoal, coal or coke fire, and slowly evaporate the quicksilver off them. Where admissible, the fireplace of a spare boiler can be utilized, using a thin red fire. After the entire evaporation of the quicksilver the plates should be slowly cooled, rubbed with muriatic acid and put in a damp place over night, then rubbed with a solution of sal ammoniac and saltpeter, and again heated slowly over a red fire. They must not be allowed to get red hot; when the proper degree of heat is reached the gold scale will rise in blisters, when the plates should be taken from the fire and the gold scraped off. Any part of the plate on which the gold has not blistered should be re-rubbed with the solution and again fired.

The gold scales should be collected in an earthen dish and covered with nitric acid, till all the copper is dissolved, when the gold can be smelted in the usual way, but after it is melted corrosive sublimate should be put in the crucible till a blue flame ceases to be given off.

A GOOD CHRISTMAS PRESENT to your friend would be a year's subscription to the MINING AND SCIENTIFIC PRESS.

Concentrates.

MONTANA expects to show a gold production uggregating $5,000,000 in '94.

THE Angels *Echo* says the owners of the Smadeke mine have refused $350,000 for it.

THE United States Treasurer figures the nation's gold yield for '94 at $43,000,000.

THE Cerbat gold mine, Mohave Co., Arizonu, is reported bonded to Ohio men for $250,000.

THE Bi-Metallic assay office at Phillipsburg, Montana, was destroyed by fire last Saturdny.

THE United Verde, Arizona, copper mines are now producing 2,000,000 pounds of copper monthly.

A TEN-STAMP MILL will be built by Mr. Mallows on the Golden Shuft claim at Dutch Flat, Cal.

THE James ten-stamp mill in Pioneer district, Amador Co., was totally destroyed hy fire lnst week.

THERE are 360 stamps dropping at the Treadwell mine, Alaska, working 216,000 tons of ore a week.

THE Elephant and Huffman hydraulic mines near Volcano, Amador Co., report good returns this month.

THE railroad which W. A. Clark recently built to his Arizona mines cost over $400,000 and is thirty miles long.

THE C. O. D. silver mine, sixteen miles from Kingman, Arizona, has been bonded to San Francisco men for $75,000.

THE Calumet and Hecla copper mines have paid a dividend of $5 per share, making a total of $42,500,000 paid to date.

THE *Transcript* reports the Home Mining Co., near Nevada City, to have struck rock worth $1000 n ton and plenty of it.

THE Redding *Free Press* says that the lessees of the Niagara mine took out over $500 in one pan of decomposed ore recently.

C. D. LANE has bought the Mayflower mine at Canada Hill, Nevada Co., from the Miners' Foundry, paying $50,000 therefor.

THE Colon mine, located near Triuidad, Sonora, recently owned by Messrs. Olea, has been sold to an American compauy for $200,000 cash.

THE Colon mine and the Canavau mine, in Sonora, Mexico, have been sold to American parties, the forner for $200,000, and the latter for $90,000.

THE Excelsior Water and Mining Co. at Smartsville, Nevada Co., has finished a series of dams through its worked-out claims to corral the debris.

THE Idaho M. Co., composed of Salt Lake men, will spend $6000 in the erection of a ten-stamp mill at their mine in Pisgah district, Bingham Co., Idaho.

GLEASON & HOFF are about to put in a five-stamp mill at their gold property at Escondido, Cal., where they have developed a promising prospect.

AT Trinity Center, Trinity Co., S. P. Fillman, of the Redding Water Works, will put up a ten-stamp mill on one of the Vollmers and Sboemaker claims.

PINE VALLEY in western San Diego county is coming to the front as a gold camp. Stamp mills are beiug erected and considerable development is going ou.

ROBERT MASSON, of Loon lake, Wash., has located a mineral claim in the Huckleberry mouutains which assays 110 ounces in silver, 8% in copper and $12 in gold.

A NEW YORK syndicate will explore gold placers in Sonora. Don Lauro Aguirre has furnished a report of the exteut and richness of several gold placers in the State of Sonora.

GERMAN mineralogists have discovered that some of the gold mines worked hy ancient Romaus in central Portugal will yield a handsome profit if worked by modern methods.

MESSRS. CAILIST & CO.'s reduction works at Grass Valley have been sold out to Selby Smelting & Lend Co. at Vallejo Junction for $5000. The works are now being demolished.

MINERS arriving in Baker City, Or., for the winter from the Grande Ronde river placer mines, sixty miles away, report a very prosperous seasou and have the gold to show the results.

THE Drum Mountain Miuing Co. has incorporuted in Detroit district, Utah, with a capital stock of $1,000,000. They are all Minneapolis men. James D. Pardee, Salt Lake, is manager.

S. G. EMMONS bas broken ground for a two-foot gauge railroad from Amador to the main line at or near Carhondale. He has bought a depot site aud is ahout to let a contract to grade it.

A $500 NUGGET of pure gold has been found in the Osceola, Idaho, placers. A $1000 nugget was picked up on the same ground several years ago, and several $300 pieces have been found this season.

J. B. MCGEE, from the Bohemin mines, Jackson Co., Or., reports the Annie mine in full operntion dny and nigbt, taking out about $400 in gold per day; also that the other mines nre running in full force.

SIXTY MILES from Banning, Cal., on the desert, is the new mining camp of Langville. J. and G. W. Lang have twenty men at work mining and milling gold ore, and considerahle prospecting is being done.

THE War Eagle G. M. Co. have a rich body of ore in their property at Northfield, B. C., six miles north of the Washington State line. They figure a profit of $45,000 a month on a daily crushing of fifty tons of ore.

THE Siskiyou Quicksilver Mining Co. of West Beaver, ou Siskiyou mountain, has a force of men at work ruuning two tunnels to find a more extensive body of cinnahar before starting up their furnaces in retortiug.

GOLD has been found in the neighhorhood of Goude, the last village on the Swiss side of the Simplou road, and the laying out of mines is already in process. Hundreds of workers are going to the new Alpine El Dorado.

MINERS of Oregon have written the Executive Committee of the California Miners' Association asking for a copy of its constitution and by-laws, that they might have them in forming a similar orgnnization in that State.

IN the gold district about Pierce, Idaho, 10,000 acres of ledges and placer ground have been located this season, some especially promising free gold ledges having heen taken within the last two months. Four flume companies are now operating in that district, on Rodes creek, Oro Fino, Oro Grand and French creek, and two sawmills are being put in to furnish lumber.

THE Mobave *Miner* says the A. & P. road contemplate putting on two light draft hoats to ply hetween Needles and El Dorado Canyon, at such times as the water may be too low for the large steamers of the C. S. N. Co.

LEADVILLE'S 7000 population has douhled since the recent gold discoveries near the old carhonate camp. One report says there is a twenty-foot ledge of very rich ore in the Ibex, and thut the owuers of the mine have refused $15,000,000 for it.

THE U. S. Debris Commission is about to bring suit uguinst the North Bloomfield Co., the preliminary being a restraining injunction, the charge heing that the defendant is operating without legal permit. This will be the first suit of the kind.

AT the Lucille mine, near Plymouth, Cal., the mill is now rendy for use. Considerable new machinery hns also beeu put in. The Pioneer mill is finished, and the ten-stamp mill at the Bny State ready for crushing. A twenty-stamp mill is to be erected at the Richmoud.

IN the southwestern corner of Yavapai county, Arizona, is Eureka district on the Santa Maria river, where several veins of frec-milling gold ore havo been discovered. Ahendorf & Co., who own the Waters mine, are about to put a ten-stnmp mill on their property.

THE Anneonda Company is reported to have declared its intention to reduce the output to 6,000,000 pounds of fine copper monthly. This would amount to a reduction of nlmost one-third from wbat it has been during the past few months, when their produetion was exceedingly heavy.

A. NEUSCHWANDER, who has the horax plant thirty miles south of Kennedy, Nevada, is producing about twenty tons of refined horax a month. The marsh is proving a highly remunerative business. Borax is worth seven cents a pound, making the monthly product of the plant $2800.

GORGEOUS stories are told of the richness of the Grijalva mine on the Hassaynmpa, near Phœnix, Arizona. The ore is reported heing taken from a four-foot ledge, any that does not run $150 n ton being rejected, and the owners are said to be reveling in wealth produced from three arrastras.

THE Grant's Pass *Observer* says: The mining industry of Josephine county is fast coming up to the point of importance that has long heen anticipated. The town of Grant's Pass is completely surrounded hy mines. From every point of the compass cau be found good paying quartz and placers.

THE Wannacott Lake Milliug and Mining Company have ohtained a patent for ten quartz claims, covering the townsite of Goldeu, in Okanogan county, Wash., and adjacent lands on the northwest and south sides of same; also the land on which the stamp mill aud other company huildings are located.

CAPT. BRADFORD of Deuver has a new secret process that has got $26.40 a ton out of gold ore that the Mercur Co. of Utah could get hut $14 from. He has offered the Mercur Co. to put up a mill without a dollar of cost to them, he to he given a certain pereentage of the gold he extracts from their ore.

D. C. LANE is mining silver and lead in the Darwin district in southern Inyo, nhout twenty-five miles south of Owens lake. He hauls his ore tweuty-five miles by team to Keeler, the terminus of the railroad, and ships it from there hy rail to Selby's Smelting Works here, clearing $100 hy each operation.

CONSIDERABLE interest is taken in Utah, Colorado and elsewhere over the reported smelter combine, which is thought to include a uniform method of assaying. Ores are assayed in Colorado hy scorification; in Utah by the crueible process, and the stated intention is to adopt the former iu the interests of the combine.

THE world's output of gold has increased from 702,828 tons in 1890 to 2,217,843 tons in 1893; hut during the same period the yield per ton decreased from 13.36 to 10.09 pennyweights. It is considered the steady decrease in the yield per ton is due to the exhaustiou of the higher grade, free-milling ore near the surface.

A LARGE force of men will be employed at the Gold Valley mine, Sierra Co., this winter, sinking the large compartment shaft and getting the hoisting machinery in place; also getting out ore ready for the reduction works when completed next summer. The Extension Mining Company have completed their electric plant for the working power of the mine.

THE Carson G. and S. M. Co. hns sued the North Star Miniug Co., Nevada Co., in the U. S. Circuit Court for alleged infriugement upon its Irish-American mine, charging that the defendant has taken ores from its mine valued at $825,000. The suit grows out of an old dispute ahout the boundaries of the mine, and involves in general the same question as that between the Champion and Wyoming.

A PROMINENT Butte operator thinks the price of silver is going dowu and that copper is going down to six cents a pouud. Taking these two surmises into consideration, he thinks it is likely that an attempt will be made to reduce the rate of wages iu Butte in order to compete with the Lake Superior copper mines, in which district the rate of wages is much lower thnn in Butte and transportation rates much less.

THE Pinacate district, so long worked, and around which hangs so much legendary lore, is given fresh prominence by recent developments. The Good Hope is the most celebrated of the old mines of the district. Iu the old Spanish occupancy it was worked hy Mexicans and Indians, who carried the ore to the surface in skin hags. Ahout a year ago a Colorado company bought it. They put up a twenty-stamp mill, and the miue is uow a good paying property. The Santa Rosa, Santa Fe and Alice mines also send good reports.

THE Virginia City *Enterprise* wants Director Preston of the United States Mint Bureau to tell how he knows that the silver mines of the United States produced 60,000,000 ounces of fine silver in the fiscal year ending with June 30, '94. On this subject the Salt Lake *Tribune* says: "It is both amusing and impudent in the Director of the United States Mint to claim that the silver production of the United States for the fiscal year ending with June, 1894, amounted to 60,000,000 ounces, when everybody knows that the silver production of Colorado, which heads the list of silver States, fell off more than thirty per ceut in that period. As a matter of fact, the mines of the United Stntes never produced 60,000,000 ounces of silver in any year." A good many authorities agree in the statement that the nation's silver yield in '93 aggregated 60,000,000 ounces. It is not likely, however, that the silver output for '94 will exceed 40,000,000 ounces. Sixty-five cents an ounce seems to he the extreme limit at which the white metal can he mined and save loss.

AT Bartles precinct in Siskiyou county, Cal., in the McCloud river timher helt, and comprising a territory as large as Delaware, only five votes were cast in the Novemher election. At the polling place stands an idle sawmill, which cost $100,000; a printing office, locked up after four years' publication of a paper; a well-furnished hotel, with few customers near to patronize it; near hy a coal mine, extending over half a township; and, stretching away for twenty-five miles in any direction, a mighty forest of piue, fir and cedar timher. The existing financial depressiou has, for a time, "killed" all enterprises in the Bartles precinct, where, if money was plentiful and lumher and coal in demand, 4000 people would he husy.

THE town of Copley, twelvo miles above Redding, nnticipates a boom from the Iron Mountain improvements. Seven miles of railroad will he built from Iron Mountain to Copley. The grade, according to the survey now made, is a good one, but another survey will be made which, it is thought, will give an easier grade. The mining engineer of the English company which proposes huying the Iron Mountain property is working up dnta on railroads, hridges, mill sites and water powers. The land owned hy the new company about a mile south of Coploy will be the prohable site of the new works. The roasting of 400 tons of pyrites a day will oxidize 200 tons of sulphur a day. The Iron Mountain mill is turning out hullion high in gold.

THE report of the superintendent of the Homestnke Mining Company for the fiscal year ending July 1, 1894, shows that the net proceeds from gold bullion were $1,372,669, and from other sources $117,000, making a total of $1,489,669. In dividends there have heeu paid $181,000. The stock pays fifteen per cent every three mouths. There is sufficient gold ore in sight to keep the mill at work for eight years at its present capacity. This report touches only the Homestake mine and mills, and does not include the Highland, Deadwood Terra and other properties generally included under the name of the Homestake minc. The Uuited States now has pending a suit for $700,000 against the Homestake Mining Company for trespass on timber land.

THE new rapid drop stamp uill, Denver pattern, which is heing erected in Black Hawk, Col., above and adjoining the Peun Company's stamp mill, will be three-terraced and will be provided with automatic ore feeders, says the Central *Register-Call*. It will be so arrauged as to dump the ore on the first terrace, where it will he seized by means of an improved ore hreaker, the ore passing down to the automatic feeders on the second terrace or floor. The third terrace will contain humping tahles, with sufficient space left for the storage of tailings. The mill, although of only twenty-five stamps capacity, at the speed the stamps will drop, will have the crusbing capacity of au ordinary fifty-stamp mill. The new mill is quite an innovation over former methods used in treating milling ore of the county.

MINERS goiug into Moutana from the Cœur d'Alene report the co-operative plan of working the Morning mine a failure. According to their story, about 100 men were at work mining ore a week ago, but twenty-five have quit and the rest will leave on the first of the month. The average wages made is ahout $1 a day. All receive the same pay—miners, shovelers, carmen, timber men and all. The miners say this is unfair, because it allows inexperienced men to come in on the same terms as men who have spent their lives in the mines. They also claim that the executive committee places men in responsible positions who are totally unfit for the work they are required to do, while at the same time they draw four or five times the pay that the miners draw, simply because they are not classed among those working on the co-operative plan.

TALKING of the "Beam Process," the inventor, who bas a mill near Telluride, Col., says: "It is a carhonizing instead of a desulphurizing process. The ore is roasted in our tight muffles, and the gold is dissociated from the gangue and other matter so that when the air is admitted none of the valuahle metal is lost. The air we can absolutely control and the heat is never above 600° to 650° Fahrenheit. There is no chance of losing gold by the heat. In roasting anything that contains carhon can he used, but we prefer coal dust free from grit. The silver in the ore is saved in amalgamating and the copper is put in a condition so that when leached in hot water it has only to he precipitated. We have never made any effort to save the lead, hut know that we can take it out successfully. The mill we have heen experimenting with, employing only one man on a shift, can handle fifteen tons of dry ore and six tons of eoneentrates daily, and we have determined to our own satisfaction that we can roast any refractory ore at $1.25 per ten, including lahor and fuel."

Obituary.

IT was a surprise to many to hear of the death of Geo. H. Roe at Brooklyn, N. Y., last Monday, in the forty-third year of his age. He had been so long the embodiment of business and energy that few supposed he would suffer such untimely taking off. For fifteen years he was one of the foremost men in the electric light aud power supply business in this city, and amassed considerable wealth thereat. He was president of the Edisou Light and Power Co. and secretary of the California Light Co. Six months ago his health failed and since then he had been a dying man. The remains will be brought to this city for interment.

THE United States Debris Commission has withheld approval of the plans offered by the Gold Run Mining Co., to build a restraining dam in the North Fork of the American river. The report of Lieut. Gillette and Mr. Storey was that the canyon of the stream for twelve miles above the site of the proposed dam contained such quantities of movable debris as to preclude probability of the dam's effectiveness for the designated purpose. The Commission has recommended the applicants to amend their plans, and indicates that another site for the dam would meet with more favor.

Notes on the Gold-Bearing Black Sands of California.

NUMBER III (CONCLUDED).

Written for the MINING AND SCIENTIFIC PRESS by J. A. Edman.

The occurrence of black stream sands is not determined by any special geological horizon, nor confined to any distinct portion of each gravel deposit. While most abundant in the lower strata, they are also found in the upper beds, and frequently of great value in the surface gravels. This is strikingly illustrated in many of the bars in the lower reaches of the larger tributaries of the Sacramento river, and also in many benches, flats and valley deposits of the interior, and occurs wherever valleys or basin-like depressions, origiually filled with light material, have undergone a concentration by streams constantly changing their beds, in which case the gold with the black sand is left at or near the surface, and frequeutly becomes appareut after heavy rains. Such deposits carry the largest percentages of black sand, and generally very fine gold.

The quantity of black sauds in origiual deposits varies greatly, generally ranging from one-tenth per cent up to one per cent, probably averaging somewhat less tban one-half per cent, when reduced to tbe standard of size and gravity above mentioned. The mixed stream sand from tailings, particularly sucb as have become concentrated by running water, contain much more, frequently exceeding two per ceut. The richest mixed stream sands are found when a deep tailing deposit in a stream bed with a moderate grade bas gradually heen concentrated by running water almost to the origiual bed, with but a few feet in depth of very heavy sands remaining.

The determination of percentage should always be made, both in original gravels and tailings, by careful grading of material by means of gratings, riddles and sieves, and under water for the fiuer material. Tbc coucentratiou should always take place on apparatus in motion, like percussion or shaking tables, aud on a small scale may be done with a good rocker in the hands of au experienced person. The final conceutration for sample can be done by careful panniug in clear water, but must not be carried so far as to allow the waste of auy of the black sand. Conceutration or grading in a free flowiug stream, like a sluice, is entirely out of the qucstion.

Practically, the black sands sbould, in the operations of the gravel miner, receive the attentiou and occupy the place of concentrates with the quartz miner. During years of experiment the latter has finally become aware of their importance and value, and has shaped his operatious accordingly. Tbe time has passed for the intelligent miner or mining engineer to indulge in the customary sneer at microscopic gold, which to-day forms the bulk of the bullion product of our quartz mills. Under the new conditions of gravel miuing a fitting time has come to introduce methods for the preveution of waste and the utilization of the now existiug waste products of hydraulic miuing.

VALUES IN BLACK SAND.

The gold found in the stream sands occurs in varieties as great as the coarser gold obtained in gravel mining, in form, color and quality. While smooth, rounded and flattened grains aud scales appear, much is rough, showiug little or no abrasion. Tbe percentage of microscopic gold varies, and, taking its limit at $\frac{1}{200}$ inch diameter, may be estimated to exceed fifty per cent of gold contents. Thin scalc gold, although occurring among the sands of the lower river hars, never attains the attenuated forms of the beach gold. Apparently the cessation of attrition occurs wbeu the size of gold grain equals the average interstitial spaces of the smallest grains of sand of the deposit. The infinitely minute gold particles of the gold veius are also lacking, although diligently searched for, and their absence may be accounted for by chemical action of the solutions continually percolatiug through most deep gravel heds. Further investigations will prohahly show that most of the gold so dissolved has again been precipitated by the orgauic matter present in the hlue gravels, while the light-colored and red gravels furnisbed the irou solutions that exerted the solvent action. At present tbe pyrites iu the blue gravel carry much of the gold derived from solutions, as was noted years ago at French Corral and other places. The nodular and grauular pyrites from hlue gravel has often beeu fouud gold bearing by the writer, oue sample from a drift mine in Butte county containiug $173 per ton, with uo gold visible except under the microscope.

Gold is present in origiual stream sands, both free —that is, as distinct grains originally set free from their matrix and now met with as pure or coated—and as combined or yet enclosed iu rocky matter. The former appear on closc inspection; tbe latter require further mechanical or chemical treatment for tbeir demonstration and reduction to economic uses. The free gold often occurs coated in whole or in part by the oxides of irou and mangauese, aloue or combined with lime, alumina, magnesia and silica, which frequently form a compact shell or crust arouud the particles, reducing their specific gravity and preventing their amalgamation. Much of the loss of comparatively large gold is due to this cause. In one sample treated, eighty per cent of the free gold was thus coated by iron oxide; in another instance nearly as much with a deep hlack iron—manganese crust, removable only by griuding.*

The combined gold is found in pyrites—massive, nodular and in crystals, both hright and oxidized; also, iu limonite, in hematite and in ilmenite. Tbe frequent occurrence of the gold iu the Brazilian mines in hematite, led to its discovery in the black sands of California. Its presence in tbe ilmenite has not hefore been noted. The two latter occurrences are not common to all the stream sands investigated, but are generally confined to the oldest Tertiary deposits of metamorpbic gravels. Tbe combined gold of all kinds contributes a large portion of the gold values of our hlack sands, often reacbing eighty per ceut.

THE PLATINUM METALS.

Altbough the principal platinum producing section of California—about the Klamath river and its tributaries—bas not been accessible to the writer, platinum is found in many of the channels of Sierra and Plumas, chiefly on and adjacent to the great serpentine belt traversing these counties. It occurs in the stream sands always in small and worn grains and scales; occasionally in globular particles, and of varying purity and color. It is nearly always associated with iridium and osmiridium metals, in small quautities. Its value is not inconsiderable, as it frequently ranges above two ounces per ton; in one instance to nearly seven ounces.

Cassiterite, as wood tin and stream tiu, occurs in many samples of black sand treated, generally in small quantity; in one instance rather abundant. It would add materially to tbe value of some sands, in any general scheme for tbeir utilizatiou. It has also been found in large grains and small pebbles in some of the surface gravels of Plumas county. The collectiou and sale of stauniferous stream sands has long heen practiced by the gold miners of Australia.

Metallic copper occurs among the black sands of the north fork of tbe Feather river and its branches, in rough scales aud grains, generally with black surface; but it is uot abundant enough to be valuable. Large nuggets of copper also occur in that region.

The origiual stream sands described above have mainly been derived from the flumes and sluices of hydraulic mines. In some instances they were obtained directly from a gravel bank, for determination of percentage of hlack sand.

MIXED STREAM SANDS.

These sands are always obtaiued from tailings of gravel mines, and represent material more or less concentrated by natural causes. They form the most valuable and hitherto ueglected sources of wealth concealed in the immense bodies of waste matter accumulated in creeks and river bottoms during the last thirty years of gravel mining. The coucentratiou of tbese deposits, as hefore mentioned, has been determined by local conditions and is slight when situated in high and dry localities, when only tbe finest sediment has been removed When they occur in larger streams, exposed to the sorting action of running water, they are highly concentrated and become valuable. In addition to the minerals contained in the original stream sands, tbey also represent the waste products of gold mills discharging iu the streams adjacent. These consist chiefly of gold, both free and combined with quartz; gold amalgams of various kinds; mercury, mostly floured; limonite; pyrites; galeua; wulfenite, and various otber concentration products from mills.

In the concentration of tbese sands for sampling, a very fine or dust-like light brown sand is noted, of a specific gravity of 3 to 4, which contains much quartz gold. Concentration should cousequently not be carried far enough to remove these, but be directed to produce a sample of about 4.25 to 4.50 specific gravity. The limonites are often crusts, but generally pseudomorph after pyrites. Other sulpburets are analogous to those found in quartz mills. The galena, although worn, generally shows its cubical structure.

Metallic mercury is seldom found, except iu the close viciuity of a mine. It has generally combined with gold to a defiuite amalgam which is crystalline, in cubical and octahedral forms. Even larger grains and scales of gold escaping from placer mines, slightly amalgamated and for a loug time reposing among tailings, combine with the mercury into crystalline amalgams of a pale yellow color. All these minerals help to raise the gold contents of the mixed stream sands.

It should not be assumed that all black sauds carry gold in workable quantities. In common with ores and coucentrates, they occasionally occur barren, chiefly in tbe shallow gulches and ravines. Oftener they contain gold in small amounts up to $10 per ton. It may he set down as a fact that all the black sands from a non-volcanic, Tertiary deposit will go above that tenor and geuerally up to $50 per ton. Simple inspection with a magnifier will not determine tbe values in any instance, but may serve to approximate the free gold contents. Of necessity, the black sauds cleaned up from drift and hydraulic mining operations, from cuts and flumes, are the richest in free gold and generally range above $100 per ton, frequently reacbing $500.

* See Whitney's Auriferous Gravels, pages 390, 519 and 526.

GOLD CONTENTS OF TYPICAL BLACK STREAM SANDS, MIXED AND ORIGINAL, OF VALUES ABOVE TEN DOLLARS PER TON.

Number.	Description. Class of Sample.	Whence Obtained.	Gold Contents—per ton. Above Standard.	Standard Sample.	Total Value.	Platinum Metals; in ounces, per ton.
			$	$	$	
1	From cleanup of flume.	Hydraulic mine	1672	351	2023	....
2	From cleanup of flume.	Hydraulic mine	775	193	968	....
3	From cleanup of flume.	Hydraulic mine	1052	229	1281	6.70
4	From cleanup of flume.	River bed	....	152	152	....
5	From cleanup of flume.	Gulch	63	32	95	....
6	From tailings	Hydraulic mine	....	354	354	1.92
7	From tailings	Hydraulic mine	....	....	42?	....
8	From tailings	Hydraulic mine	....	....	119	4.25
9	From tailings	Creek bed	211	49	260	....
10	From tailings	River bed	....	....	52	....
11	From tailings	Hydraulic mine	....	....	58	....
12	From tailings	Hydraulic mine	....	....	94	....
13	Original black sand	Upper stratum of deep gravel	....	....	11	....
14	Original black sand	Upper stratum of deep gravel	....	....	42	....
15	Original black sand	River bed	....	....	132	....
16	Original black sand	Surface placer mine	181	113	294	....
17	Original black sand	Upper stratum, creek gravel	....	....	12	0.60
18	Original black sand	In bedrock, creek bed	....	....	26	....

In No. 1 considerable fine gold could be seen on close inspection; much less in Nos. 2 and 3. In all the others, excepting Nos. 9 and 16, that showed a few colors, no gold was visible to the naked eye. Numbers 3, 6, 8, 9 contained tin ore, No. 6 in same quantity. *Average weight of samples two pounds.*

Tbe ahove lots were not specially selected on account of their richness; many of them when received by the writer were stripped of all visible gold contents.

No special obstacle exists to the sampling of tailings, so far entirely neglected. The much controverted point of loss of gold in hydraulic operations can be determined only by that method. The black sands of ten tons may suffice for a small deposit; one hundred tous or more for a large one. From 100 pounds up to one ton of black sand thoroughly treated the gold conteuts could be determined with accuracy.

The methods of conceutration and extraction of the gold, although tested experimentally, can not at present be presented to tbe pubilc.

An inquiry into the relative merits and serious disadvantages of the hydraulic method of mining, as contrasted with otber modes of gold mining, ancient and modern, in connection with the evidences offered by the study of tbe black sands, must be reserved for another communication.

Meadow Valley, Cal., Nov. 21, 1894.

Saving Fine Gold.

TO THE EDITOR:—Last Octoher, in Idaho on Snake river, I heard of a chemical process for saving fine and flour gold being used in the big bend of tbe Columbia river, went there to see the workings of the system and found four claims using the cbemical process invented by Banta & Wink, of Seal Rock, Oregon. Tbe men using their boxes were taking out on an average $5 per day to the hand of gold that would not yield fifty cents per day by the common sluicing process. I made up my mind that I would fully investigate tbe process, came here to do so and am fully convinced that wbat they are using is of great benefit to the mining industry. They saturate the bottoms of their hoxes with a chemical solution which attracts every particle of free gold and it adberes to the box, even if gold is rusty or greasy. There in the black sand on the beach (where there is very little gold) it separates every particle of the gold from the sand and enables tbem to save three to five dollars per day from dirt that will not yield ten cents per day by the old sluicing process. It will save the fine flour gold that will not amalgamate with quicksilver or is too fine to sink or too rusty to save by auy process uow iu use. There are thousands of places all over the coast known to miners where there is gold in paying quantities but wbich will not amalgamate in the ordinary way, therefore cannot he worked at a profit, as every metbod now in use would be too expensive. But this chemical process of Banta & Wink will enable them to be worked; for tbe expense is nominally nothing. Next year there will be hundreds of miners on the Columbia and Snake rivers usiug this system and turning into coin thousands of dollars of fine flour gold that is lying in the sands ou tbose rivers and without it would continue to lie there.

FRED BURTON.

Seal Rock, Oregon, Dec. 1st, 1894.

MUCH of the pecuniary success of a manufacturing enterprise comes from a careful regard to wbat are called "by-products." The liquid waste from a hig rail and rod factory in Salem, Obio, has formerly gone into a stream there. It will now be caught and made into copperas, which change will not ouly yield further revenue, but also improve the quality of the water in the stream.

Early Quartz Milling in Grass Valley.

The following article of local interest, is contributed to the *Engineering and Mining Journal* by G. F. Deetkin M. E. of Auburn, Placer county:

A prominent mining man recently made the statement that in early days such a thing as concentrators were unknown. No sulphurets were saved. Even the great Idaho mine at Grass Valley was worked many years without even having a concentrator of any kind. As the writer was one of the earliest on the ground in chlorination and consequently interested in the saving by concentration of the sulphurets from the tailings of the mills, some facts on this subject may be of historical interest.

The first concentrates, or sulphurets, were saved in this State by the Chavanne brothers and William and Robert Watt; also by Mr. Fricot, at Grass Valley, and by Nelson Soggs, of the Nevada Quartz Mine, at Nevada City, in 1857. The Grass Valley mining men used the rocker for this purpose; and Soggs, at Nevada City, saved his sulphurets by the Bradford shaking tables, introduced by Mr. Ferre. These tables consisted of large copper plates, about two and a half by four feet in area, suspended on rods, and receiving a shaking motion in the direction of the water current. They did good work.

Some Cornish miners used the "tying method" of concentration, and the first stationary hard buddle, with tossing hub attachment for finishing the product, was introduced by Mr. Houk, a Cornish tin dresser.

The sulphurets saved had to pay $200 a ton to leave a profit over the expense of shipment to Swansea or Europe, and the Messrs. Chavanne and Watt, working the Rocky Bar mine near Grass Valley, had sheds stored with hundreds of tons of sulphurets, not knowing how to utilize them to advantage. Amalgamation in Chile mills and arrastra extracted but a portion of the assay value in gold.

The writer, informed of these facts, experimented at Nevada City in 1858 and 1859 with various methods of treating the sulphurets by smelting in reverberatory and blast furnace, but the want of favorable conditions, i. e., want of lead ores and cheap fuel, also fine condition of ore, prevented him from making a success of the method at the time. Chlorination finally succeeded in giving perfect results at a reasonable cost.

The sulphurets at once found a ready market, though supplies of acid and chemicals, furnished partly from the East and hauled by the bull team were very expensive. Chlorination after overcoming the difficulties of a start, has ever since 1860 maintained its supremacy over other processes. There is to this day no essential improvement on the methods used in the early days with the apparatus introduced at the time by the writer on limited supplies of sulphurets. All present advantages arise from the cheapening of supplies, enabling the operator to use them freely and to arrive at results more closely approaching assay value.

The methods of concentration were gradually improved. The convex mechanical buddle with revolving brushes supplanted the hand buddle, and in 1871 the writer found it in use at Governor Daggett's mine in Trinity County; also at the Washington mine, Mariposa County, in 1870.

Paine and Stevens' concave buddle, with self-acting distribution of the slimes by revolving distributing arms and self-raising central riffle was the next improvement, and the Eureka Company (William and Robert Watt, superintendents), and subsequently the adjoining Idaho Company at Grass Valley adapted these machines with great success at the very start of their mills in 1865. The buddles did good work, though not as economical as later improved machines, on account of the hard labor required to double and treble the concentration product previous to final work in the dolly tub. Concentration costs them twelve and a half cents per ton of ore milled in a thirty-stamp mill. Rockers at the tail end of the sluices still saved valuable material as they do behind the concentrators of the day. Hendy's shaking tables introduced by Captain Faull at the Keystone mine, Amador County, came in extensive use in 1863, and were finally succeeded by the Frue, Triumph, Woodbury and Johnston vanners, who hold the ground in California at present.

The benefit of the treatment by concentration and chlorination of the valuable pyritiferous tailings of the gold quartz mills as developed in California were later on recognized by Australia and New Zealand. Mr. G. Thurean, mining engineer and lecturer, delegate from the Bendigo gold fields of Australia, sent out here in 1877 at the instigation of Mr. Lansing, attests in his pamphlet the value of our methods and suggests their adoption. According to Mr. T. A. Rickard the concentration and chlorination plants of the California pattern are common enough there now.

Simultaneously with the improvements in concentration of the sulphurets, the quartz milling operations in California were greatly cheapened by the introduction of automatic delivery of the rock to the crushing machines through guzzlies, rockbreaker and self-feeders. The extraction of the gold was at the same time improved by the displacement of the blanket process—saving of the gold on blankets, outside of the battery and amalgamators in Attwood's amalgamators—by battery amalgamation, doing away with the labor and expense of blanket washing.

Innumerable assays of the tailings and the lower value of the concentrates since the introduction of battery amalgamation of rock of equal value from the same mine has proved the value of the change. This lowering the value in sulphurets occurs in spite of the closer elimination of the sands from the concentrates by the present concentrating machines. The amount of silica and alkaline earths, inclusive of alumina in the Idaho sulphurets of 1892, saved by the vanners, reached the lowest limit known to the writer, viz., 3.05% against 16½% by the Paine and Stevens buddle in 1870.

Water power, wherever attainable at reasonable cost, has also considerably cheapened present methods of milling through the Pelton and later on the Dodd motors.

Automatic canvas slime tables below present concentrators are still a desideratum. The usual percentage of gold saved by our best mills at present according to Mr. J. H. Hammond, M. E., is from 86 to 90% of the assay value, an improvement of from 13 to 17% on the old blanket process.

New Gold Fields in South Africa.

Although the attraction of the new gold fields in Western Australia have so far distracted attention from South Africa, says the London *Mining Journal*, that several members of the Mining Market have forsaken the old love for the new, it cannot be but that the present revival in mining enterprise will before long be stimulating new developments in South Africa. Nothing can be more mistaken than the idea that the mineral resources of the latter country are in any degree exhausted. On the Witwatersrand itself a new era is only just entered upon in the commencement of deep level mining. Though the deep level concerns have not attracted any sensational public interest, enormous sums have been expended upon their machinery equipment, and their shares are very firmly held. It is a platitude rather than a prophecy, to say that this time next year the capital value of these shares will be far in excess of what it is now. Moreover, we are likely to see a wide extension of the principle of amalgamating the outcrop properties of limited duration with deep level claims. The gigantic Simmer and Jack proposal has already been followed by several others on these lines.

Some are now awaiting the formal approval of shareholders, while others are still in process of definite arrangement. When the unprecedentedly huge hauling and crushing plants erected on these properties are once set to work, we may expect to see a new and more striking series of record outputs. But the mineral resources of South Africa are by no means confined to the Rand. Even eliminating from consideration the tin deposits of Swazieland, and the silver and copper ores of other districts, there are plenty of other gold fields which promise future importance. To commence with Matabeleland, one cannot but be struck with the business-like manner in which both capital and energy are being provided for the prospecting of that region. The comparison with the mining history of Masbonaland is certainly unfavorable to the latter. London and Johannesburg syndicates have sent up distinguished experts, and half a dozen batteries are already on the way to commence crushing. Salisbury has remained a dormant Stock Exchange; Buluwayo already begins to assume the appearance of a mining camp. The reasons for this are numerous and apparent. In the first place, Masbonaland has always been regarded as a veritable El Dorado; Mashonaland was only a make-shift for the real Promised Land. Then, again, Buluwayo is far more conveniently situated for the transport of mining material than is Salisbury. The railway to Salisbury from Beira—"the swamp railway," as it is ignominiously called—has failed to penetrate from the coast within the expected time, and seems even now to be a less satisfactory conveyance than ox-wagons and traction engines. Mr. Maund has just been complaining bitterly, not only of the time required to carry goods from Beira, but also of the frequency with which accidents happen in transport. On the other hand, the Mafeking railway has been pushed forward with the utmost rapidity and there it no difficulty in pouring all kinds of commodities into Buluwayo. On top of this there are the excellent reports forthcoming upon the Matabeleland reefs from Mr. Hammoud, Mr. Williams, and other experts now exploring the country, and the ungrudging subscription of fresh capital by the astute financiers who are directing its development. If, as is stated, the fifty per cent clause of the Chartered Company's mining law is to be abrogated in favor of conditions more favorable to the mine-owners, we may fairly look forward to the rapid establishment of a flourishing gold industry in Matabeleland. There is no doubt that payable reefs exist in Lobengula's former territory. As for Mashonaland, the crushing reports have hardly confirmed sanguine expectations, but a reduction in the mining royalty would apply to this region as well as to Matabeleland, and there have lately been reports of a rich strike in Salisbury itself. Outside the Rhodesian territory, however, one of the features of South African gold mining has been the quiet and steady developments of gold fields in the Transvaal itself, outside the Witwatersraud. The reduction of working costs by the improvement of cyanide processes and the construction or contemplation of new railways are two factors largely responsible for this. Both the Silati and Delagoa Bay lines, for instance, will do a great deal in this direction—the former for the mines in the Zoutpansberg district, and the latter for the De Kaap and other fields. At De Kaap the amalgamation of mines and the employment of electricity for power purposes are doing much to revivify the auriferous industry. The output of the Lydenburg gold fields in the first six months of this year was more than double its amount in the same period of 1893. The return from the Klerksdrop mines this year have also shown a remarkable improvement upon those of a year ago, and there is a distinct revival of mining enterprise this center, at which seemed at one time entirely deserted.

The introduction of the cyanide system is trusted to make the working of the low grade ore a success. In face of what has been accomplished on the Rand, there is certainly some excuse for sanguine anticipations in this direction. In the Southern Transvaal, upon the borders of Zululand, English, Johannesburg, and Natal syndicates are at work developing the bankct formation with the view of floating companies to take over claims upon the strength of crushing results. The State mining engineer has condemned these fields as containing too poor ore to pay working expenses, but the syndicates concerned are hopefully continuing their expenditure of capital, trusting to new processes of extraction to make up for the small content of gold. The same thing applies to the adjoining Noudweni gold fields. There are also reports of strikes of gold in Natal and the Cape Colony, of which nothing definite is known at present. It cannot be denied that this widespread activity is a hopeful sign for South Africa gold mining. The reductions obtained at the Rand mines in the treatment of low grade conglomerate is the chief elements in the direction of enterprise to the outside fields, and viewed in that light, it is hopeful of a continuous increase in the number of dividend paying mines around Johannesburg itself.

Deadwood To-Day.

Deadwood of to-day, says the *Herald*, is a straggling village of houses and shops in a gulch. The creek that tears through the town makes a noise when men are not talking politics on the bridges. Seventeen years ago the water of this stream was clear, and men could whip trout from its depths. It is red now, and when a stranger to the village stands upon the bridge he is told by the natives that if he were to wheel a wagon from bank to bank there would be gold enough on the tires of the wagon to pay his fare to Spearfish. And Spearfish is a goodly distance. "That water is colored by the waste of the Homestake mine." these same natives will say. Continuing, they will declare, "There is gold in every riffle." The town is dead, though. Its dance houses are closed, the old-time mail coach is now a feature of a show in the East, and the limbs of the trees to which the Vigilantes of old used to string their victims are moulting.

It has been discovered that microbes capable of germination exist in the ocean everywhere except at great depths. They seem to be more plentiful in the Canary, Florida and Labrador currents than elsewhere, and are not detected in the ocean bed. They are, however, plentiful at a depth of 1300 feet, and are found as far down as 3500 feet—certainly deep enough for all practical purposes. Some of these microbes are phosphorescent, and are found on the bodies of living fish.

Tell a person to take an even number of coins in one hand and an odd number in the other. Then bid him multiply the number in his right hand by an odd number, and the number in the left hand by an even. Now let him add the two products together and tell you if the total sum be even or odd. If it be even, the even number is in the right hand. If it be odd the odd number is in the left hand.

According to the Cincinnati *Commercial Gazette*, 45,277 convicts are daily employed in the United States, turning out a product valued at $28,753,999 per annum. This product is largely in a few lines of work, such as the shoe and clothing trades, necessarily tending to lower the rate of wages paid to free labor. In fact, convict labor costs only about one-third the wages given to free labor.

The scientists of a European expedition now in Ecuador have been making analyses of ashes which fell 150 miles away from Cotopaxi at the time of its last eruption. They have found them to consist mainly of feldspar, quartz, maquetite and specular iron ore. One sample yielded silver at the rate of 200 grains to the ton.

Big Trees "of California" Found Fossilized in Colorado.

Written for the MINING AND SCIENTIFIC PRESS by Prof. A. Lakes of Golden City, Col.

The California big trees, or *Sequoia gigantea*, so familiar to the dwellers on the Pacific slope, and so celebrated throughout the world, have an interesting geological history and pedigree. Not only are they, perhaps, the oldest trees now living in the world, but they date from quite an early geological time. They were among the first genuine trees, like those of the modern age, to appear on this planet, for we cannot consider as trees proper the gigantic and fantastic reeds and mosses which preceded them in the old Devonian and Carboniferous times. Those were rather gigantic plants than true trees, despite their great height and thickness. The Sequoias made their first appearance in that middle portion of the world's existence known as the Mesozoic or Middle Life era, and in that subdivision of it called the Cretaceous—an age teeming both on sea and land with strange reptilian life. The fossil remains of these trees are found scattered over the northern hemisphere, even in the rocks beneath the eternal snows of Spitzbergen, Melville island and Greenland. They are found also in the same class of rocks in Canada, Saxony, Bohemia and Belgium. In the rocks of the succeeding Tertiary or Mammalian age they are found fossilized all over the world—in Greenland, Spitzbergen, Alaska, Sitka, Colorado, the Hebrides, and down through Asia to Italy.

Though there are but two varieties of these trees now living and those confined to the Pacific coast, in those olden times there were as many as twenty-six varieties extending over the northern hemisphere from latitude 43° to 78°, and even as far south as in the Tertiary rocks of Australia. Truly, these most ancient of living trees are monuments of the great past, "survivals of the fittest" living on into the living present, and as we stand in awe before their colossal forms we may say

This was the forest primeval.

The great Reptilian age begun with dreary forests of reeds and these tall pines, probably but little frequented by the great lizards which forsook these dismal shades for the warmer swamps and beaches of the sunny coast.

With the Tertiary there is a sudden influx of trees like those of to-day, coming on like a sudden creation without any marked intermediate forms from which they could have gradually evolved. Throughout the Rocky mountains we find abundance of the fossil remains of such trees, many of them of a semi-tropical character, such as the sweet gum, persimmon, tulip tree, magnolia and others, some of which are common in California gardens to-day. With these were such common temperate zone trees as the chestnut, birch, maple, poplar, etc. Nor were such trees limited as now to the modern temperate or semi-tropical trees, for we find their fossil remains imbedded in the rocks below the snows of Greenland and in Vancouver island. The tulip tree, for example, is often found in the rocks of the arctic circle. The causes of the change of climate which brought about these changes in the habitat of this vegetation, is too abstract a matter to describe here. It seems as if the march of vegetation and tree life had been from to north and arctic zone toward the south, and as if a semi-tropical Garden of Eden had existed in the region of now perpetual snow and ice.

The rocks of Colorado of the upper Cretaceous and Tertiary periods are full of fossil wood and fossil leaves, and by the erosion of these beds we find quantities of fragments of fossil wood scattered over the prairie among the surface drift. These fossil woods doubtless belonged to the trees we have mentioned, such as oak, poplar, hickory and palmetto. Not unfrequently we find their stumps standing erect in the strata in the position in which they originally grew.

During the past summer, on my way from the gold mining region of Cripple Creek, I stopped at Horrissant station, a locality noted for its fossil trees, as well as fossil insects, leaves and fishes, imbedded in its shales.

Here, right in the heart of the granite hills, we have the relics of a small Tertiary lake represented by horizontal beds of shale and sandstone, abutting against and skirting the flanks of granite hills, which must have formed islands in the lake, or traceable up many little valleys which may have formed creeks and bays.

Around the skirts of one of these ancient granite islets, imbedded in the shale which is composed of fine volcanic material, are a number of gigantic fossil stumps—a few years ago, doubtless, rising a foot or so above the level of the meadow, but by the work of tourists and the elements now for the most part leveled with the soil. These stumps, whose diameters vary from six to fifteen feet, have the wood so wonderfully and minutely replaced by stony matter that, were it not for their great size and that on taking up a chip you feel its hardness and weight, one might pass them by as stumps of old pine trees cut down by the axe of the settler of a few years ago. The prevailing color of the wood is an ashes gray like a dry chip, but sometimes the infiltration of a little iron has almost restored the original redwood color. Not only is the wood and bark microscopically and molecularly replaced by stone, but even the minutest as well as the larger sap veins are replaced by translucent chalcedony and opal, simulating fossil gum.

One of the largest of these stumps has been unearthed down to the upper portion of its roots by some parties who contemplated sawing it up in vertical lengths and transporting it bodily to the World's Fair. But, despite their improvised machinery and stone saws, they, happily for Colorado, signally failed. They found the hard silica of the tree too hard for their stone saws, and the latter are seen still sticking in the stump as monuments of their vandalism and failure. By the grain and general appearance of the wood, despite its being turned to stone, a Californian would at once recognize it as his native redwood—a presumption which is proved by microscopic examination of fine sections of it as compared with the living redwood. The diameter of this tree as it stands about twelve feet above the bottom of the quarry is fifteen feet. In the fine-grained, paper-like shales enclosing the tree we found numerous remains of fossil insects, such as ants, grasshoppers, lantern flies, beetles, etc., and some years ago Professor Scudder discovered a perfect butterfly, the impression so exquisitely preserved that even the pattern of the colors on the wings were easily recognized. Only one or two specimens of fossil butterflies besides this have been discovered in the world. The remains of a sparrow and fresh-water fishes and shells have also been found in the same beds.

The history of the lake and its fossil remains seems to be as follows: There was in Tertiary times a lake among these granitic hills, by the side of which grew these sequoias, together with many other kinds of trees, as shown by the varieties of leaves found. Fishes inhabited its waters and insects flitted over its surface or basked on the wet mud at low water as butterflies are often seen to do nowadays by the mud of a stream. Winds blew leaves out on to the surface, which sunk to the bottom and became imbedded in the mud. Insects in various ways found a grave in its waters and a burying-place in its muddy bottom, and the great sequoias growing on the banks died of old age or by the rotting of their roots from the encroaching waters, and their stumps were entombed with the other remains. On the shores of this lake—perhaps like at Lake Mono in California—were a number of volcanic vents, which, in their periodic explosive eruptions, threw up clouds of volcanic dust and ashes which fell back in showers into the lake and contributed the material that entombed the fossil life. Gases from these eruptions may have assisted in destroying insects and birds flying over the surface of the lake. All the shales and sandstones enclosing these remains are made up of comminuted volcanic matter sometimes exceedingly fine, as of volcanic dust, sometimes coarser. We noticed on one of the hills above the petrified stumps evidences of former hot spring or geyser action, which usually accompany the last dying efforts of volcanic action. This appears to have been as in the neighboring Cripple Creek mining region—the last phase of volcanic activity such heated waters may have assisted in dissolving silver and petrifying the stumps. The lake eventually either filled up with volcanic mud or dried up, or was drained off. Erosion wore out valleys and parks in the soft shale, exposed the buried and fossilized tree trunks, and enabled us to explore the fossil fauna and flora of the locality as to the mode of fossilizing, or the petrifying process, which is often a subject of wonder. In the case of the tree stumps, after they became imbedded in the mud, they were hermetically sealed from the air, and so immediate decomposition was for a time prevented. The trees became thoroughly saturated or "waterlogged," and with the moisture came in silicious or quartzose matter permeating every cell and fiber; and, as the woody matter of the cells passed gradually away, its place was supplied, molecule for molecule, by this mineral matter till the whole tree was replaced by stone. The insects and leaves have not been so replaced by stone; only their impressions remain in the fine mud, much as the patterns of leaves are sometimes prettily made on the cement of the sidewalks of Alameda and San Francisco.

DEPOSITS of saltpeter that promise to be the most valuable in existence have been discovered in Cape Colony. They are claimed to be true potassium nitrate, which is one of the chief ingredients of gunpowder, and is worth about $80 a ton. The principal supply at present is from Chile, but the "Chile saltpeter," as it is called, has to undergo a costly chemical process before use. Nitrate of potash is found in but small quantities as a rule, as it is soluble in water, and is therefore washed out of the soil by the rain. The dryness of the South African climate is supposed to account for the richness of the latest find, which, it is stated, will reduce the price of the mineral one-half.

Mining at Ophir, Placer County.

TO THE EDITOR:—This sleepy old quartz camp seems to be on the eve of an awakening such as it has not had for years. The following mines are now running in the camp:

The Hathaway, under the superintendency of Mr. Eastwood, is employing fifteen or sixteen underground miners and is keeping ten stamps running right along. It is making no reports of rich finds, but keeps right along crushing ore and paying its men, which is about the best sign of a successful mine.

The Harrison (east extension of the old Gold Blossom), Chas. F. Reed superintendent and manager, has been incorporated as the Gold Blossom Mining Company, with a capital of $20,000, and has a fine mill in course of erection and has a large amount of ore on hand ready to be crushed. The machinery has been slow to arrive, and everything is ready for it, so all will be in ship-shape as soon as it arrives and a crew of men will be put to work. The name of Chas. F. Reed is a guarantee that there will be no fancy prospecting, but that the mine will be worked as a business proposition.

The Old Gold Blossom or Ohio.—A company of Bay capitalists have incorporated as the Chemical Gold Mining and Reduction Company and are actively engaged in getting the works in shape to use a process of their own for the reduction of the ore. Mr. Geo. L. Brown, their superintendent, is favorably impressed with the outlook, and promises to wake up the doubting Thomases by saving the gold and silver contained in the ore up to over ninety per cent of the fire assay—a feat which he proposes to accomplish by a newly obtained process in which electricity largely enters as one of the main features.

The Boulder, under C. C. Handy, superintendent, is owned in small shares by different parties who have been hampered by inadequate machinery and poor management heretofore. Mr. Handy took charge some time ago when the company's exchequer was depleted. He has not said much since, but pays the nine or ten men employed when the end of the month rolls around, which speaks for itself. I shall write about some of the idle mines and prospects later. RESIDENT.

Recent Additions to the Museum of the California State Mining Bureau.

Mr. H. S. Durden, secretary of the State Mining Bureau, has recently received thirty-nine specimens of rare minerals presented by J. Z. Davis, viz.:

Æschynite, Amarantite, Aphthitalite, Asparagus stone, Auerlite, Barrandite, Bastnasite; Breunnerite, Carpholite, Caswellite, Childrenite, Corynite, Dawsonite, Dysanalite, Edenite, Eosphorite, Evansite, Fanjasite, Gibbsite, Gieseckite, Glagerite, Guitermanite, Haydenite, Helvite, Henwoodite, Herschelite, Humboltilite, Indianaite, Kotschubeite, Lehrbachite, Malacon, Milarite, Plattnerite, Pyrosmalite, Sperrylite, Syngenite, Tarnowitzite, Tritomite, Roselite.

There has also been received a specimen of Wollastonite—quartz-schist, a new rock from Keeler, Inyo Co., Cal. Fossil crinoid stems of unusually large size, and a number of other California fossils. Arguerite, fine specimen, from British Columbia, W. B. Logan, Jr. Fine Colemanite from Mrs. J. W. S. Perry. Polished marbles, A. L. Seager. Rhyolite, Felsite, Aplite and other rocks of California, in some cases showing the gradual transition from one rock to another.

Between Night and Day.

The exact time at which darkness gives place to dawn—the dividing time between day and night—was legally determined, and a verdict of $25,000 given on the decision, in the Court of Common Pleas in Philadelphia recently. A young woman was knocked down by a locomotive on the Reading road while she was walking over a crossing at Norristown at 6:30 o'clock in the morning of February 14, 1893. The engine did not display a light, nor did it signal with whistle or bell. The company claimed that it was not negligent, because at that hour dawn was breaking and no light was needed, and the entire case rested on whether or not it was daylight when the accident occurred.

The sun rose on the day of the accident at 6:54 o'clock. Several astronomers and other experts testified that half an hour before sunrise it is as dark as at any time of night. From that time until sunrise light comes so slowly that the point of half-light is reached only seven minutes before sunrise. During the last seven minutes before sun-up light comes very rapidly, until the full day breaks. The plaintiff's lawyer claimed, therefore, that at the time of the accident, twenty-four minutes before sunrise, it was pitch dark. The jury rendered a verdict of $25,000 in her favor.

ONLY eighteen of the 13,000 steamers recorded in Lloyd's Registry are credited with a speed of twenty knots an hour and over, and only forty-five can show nineteen knots. Twenty-five of this number were built on the Clyde.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XV.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894.

1855.—Dr. J. B. Trask, first State Geologist, a faithful and devoted State official, was first to look on these minerals with scientific interest. In his report to the Legislature of 1855 (Senate document No. 14) he called attention to their importance, abundance and value. As that report is now extremely rare, I have quoted it in full, for I am sure it must prove of interest at this time to at least some of the readers of this paper.

"Bitumen is another of the more abundant mineral products of this portion of the State, and is found in very large quantities. This article is available and well adapted to the manufacture of gas, for the purposes of illumination, and will probably be used to a considerable extent in this country, the only practical objection to such a use of it being the fact that no valuable residuum is left in the retort after the extraction of the gaseous constituents. As this mineral yields a much greater volume (being nearly double) of illuminating gas than any other in use, it is very questionable whether it would not be equally profitable from this circumstance.

"In the use of coal we have the coke remaining, which may be applied as an article of fuel; but the value of the latter in the market would probably be counterbalanced by the increased volume of illumination matter in the simple bitumen. The expense of transporting coal from distant regions must very materially enhance the price of the commodities resulting from it; but in the use of the asphaltum upon our coast, this heavy item would as a natural consequence become materially diminished. The only real objection to the introduction of the latter article for the above purpose is that there may not be sufficient quantities of the mineral obtainable for so extensive uses as would be required. This is a valid objection, and should be well considered before entering on a speculation of that kind. From what is already known of these beds, they certainly have the appearance of being adequate to the supply of any ordinary demand for those purposes, as they are frequently to be met with covering many acres of ground. This fact, however, in regard to quantity can only be determined positively by clearing one or two of the larger springs, and thus ascertaining the actual amount of the mineral discharged per day or per week; and should it be found anything near adequate for the demand for gas manufacture, the collection and transportation at fair rates of prices will form a much greater source of revenue than the entire cattle trade of those counties at the present time. A little attention to this subject will convince us that a heavy and lucrative business may be conducted in these departments of trade if the necessary measures are adopted to bring this element into practical notice, for, as stated in the preceding pages, these springs extend from the county of Santa Clara to San Diego and most of them near the coast. To illustrate more fully the advantages to be derived, and the extent of the business that now lies untouched in this particular, it will only be necessary to allude to the quantity of coal required for the purposes of illumination at present in this State. The requirements for the city of San Francisco are about 5000 tons per annum. At an average price of $22 per ton, equal to $110,000. The demaud for Sacramento is about 2000 tons, which, at the same price, equals $44,000, the total amount being $154,000. Allowing the coal to produce (which the best quality will) 1100 pounds of coke from the ton of coals, the value of the coke as sold here at about 62 cents per bushel (high price) will yield a return upon the original cost of a little more than $12 per ton, or a sum total of nearly $87. This estimate is based on the product of the Scotch coal, the specific gravity of which is but 1.27. The asphaltum of this State has a specific gravity of about 1.62, the difference in the excess arising probably from the earthy matter comprised therein. There cannot be less than 4000 tons of asphaltum lying upon the surface of the ground in the counties of Los Angeles and Santa Barbara alone withiu a few miles of the coast at the present moment. Its value determined in San Francisco would not be less than $16 per ton, equal in value to $64,000; and this amount alone would offer sufficient inducement to embark in the enterprise independent of any other consideration. The amount lying ou the surface in other adjacent counties is probably equal to the amount specified, so that 8000 tons would be a safe estimate to place upon the quantity already available.

"The analysis of this mineral exhibits the following available constituents for the manufacture of gas: In 100 parts there is found a limpid oil equal to thirty per ceut, and the same amount of charcoal, with a large per cent of ammonia, the balance consisting of earthy matter and water. Here, then, we have sixty per cent of the gross weight applicable to immediate use, the charcoal holding the same relation to the bitumen that exists in the coke to the coal. That the supply of this article is abundaut there can be but little question, and fully equal to 5000 tons per annum (the requirements of the State will not fall short of these figures for years to come), equal in value at $16 per ton to $80,009; and should it possess no more than an equal amount of illuminating matter, it will be seen that it is far more economical than the present use of coal.

"The only, or rather the principal question asked by those interested in gas manufacture is this: Is there a sufficient quantity to meet the demand for 5000 tons per anuum; or, in other words, if there is a sufficient quantity, is there every evidence of quality also to make it a reliable resource?

"The proper opening of these springs would undoubtedly furnish an ample quantity of the mineral, and, if the business should be judiciously managed, it would prove lucrative and permanent.

"It is to be hoped that this brief allusion to this subject may elicit attention from those who are intimately acquainted with the localities iu which it is found, to its proposed value as well as to the quantity which may be supplied."

(To be Continued.)

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It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a gradnate of Bellevue Hospital Medical College, of New York City.

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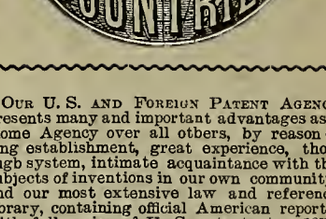

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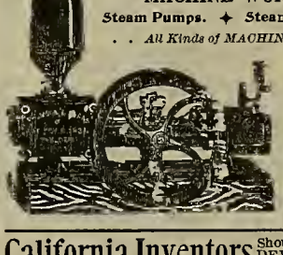

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Scientific Progress.

Horse Power of Boilers.

It is a very common thing to hear engineers connected with steam plants speaking of the horse-power of their boilers, yet if they were asked to define what they meant by horse-power of boilers, there is no doubt but many of them would suddenly discover that it was somewhat difficult to define clearly just what they did mean, and for a very good reason. Strictly speaking, there is no such thing as horse-power to a steam boiler, and in consequence the steam horse-power of a boiler is a very vague expression. But as boilers have been found so far a necessity in driving steam engines, the same measure applied to steam engines has come to be universally appled to the boiler, and like a good many other such accidental definitions, cannot very well be discarded. The unit of horse-power for boilers is not fixed except by arbitrary agreement among the parties concerned, the basis differing according to the nature of the work done by the steam. Many boiler-makers rate the horse-power of the boilers by the number of square feet of heating surface contained in the boiler. Although this rule is followed by many, it is no criterion as between different styles of boilers—a square foot under some circumstances being many times as efficient as in others; but when the average rate of evaporation has been fixed upon by experiments in one boiler, there is no more convenient way of rating others of the same style. But by an outsider no exact rating of a boiler can be made from a knowledge of only its heating surface. The following rules are observed in a good many boiler-houses, and may be useful:—For cylinder boilers nine square feet of heating surface are allowed, for flue boilers, twelve square feet, and for tubular boilers, fifteen square feet of heating surface per horse-power. Hence, if the total heating surface be known, divide it by nine, twelve, or fifteen, according to the type of boiler, and the quotient will be the horse-power of the boiler. If a boiler is tested and a statement of its horse-power desired, without regard to whether it is to supply its steam to drive an engine or for other purposes, then it is agreed upon by the majority of experts to consider thirty pounds of water per hour, evaporated at seventy pounds pressure from 100 degrees, as a horse-power. A standard was fixed by Watt at one cubit foot of water evaporated per hour from 212 degrees for each horse-power. This was at that time the requirement of the best engines in use. Most nations have a standard similar to and generally derived from Watt's horse-power, but owing to different standards of weights and measures, these are not indentical, though the greatest differences amounts to less than one and one-half per cent.

New Possibilities of Lighting.

In the rivalry between electricity and gas for lighting, the latter has recently gained an advantage through the invention of a special burner, made of rare metals that are rendered incandescent in the flame of the burning gas. As this invention is already on the market, there would be an impropriety in referring to it more extensively in these columns at present. But another possibility opened in the direction of cheaper gas-lighting is now announced.

One of the many combinations of hydrogen and carbon found in nature—petroleum and naphtha are among such substances—is acetylene. This is a colorless, inflammable gas with an unpleasant odor, yet possessed of high illuminating power. Hitherto it has not been feasible, though, to obtain it cheaply. Hence the discovery of a way to do this may prove important. Thomas L. Wilson, in treating certain refractory ores at his aluminum works, has "found that large quantities of calcium carbide can be produced commercially, from which acetylene is readily obtained." The *Electrical Engineer*, whose language is here quoted, declares that a burner consuming from one to one and a quarter feet of such gas per hour affords a light of about fifty-candle power, or about three times that of an ordinary six-foot burner with the gas now commonly sold, and three times that of the particular incandescent electric lamp that is most extensively used. The *Electrical Engineer* is "unable to discern any danger to electric-lighting interests in the new light," but concedes that it may be useful in houses not easily reached by its great rival. The discoverer, however, believes that an immense industrial development will proceed from the new mode of obtaining acetylene, the first step being the establishment of electrical furnaces to produce the calcium carbide.

Electricity as a Motive Power in Mining.

D. Selby-Bigge, in a paper on "Electricity as a Motive Power," thus summarizes the advantages of electrical power for mining operations: (1) That it can be transmitted long distances with small loss, thus making it possible to use power at such a distance from its source as would otherwise render it unavailable; (2) the conditions for conveying electrical power from one point to another require less space, are more easily put in and repaired, are easily tapped for branch circuits, and form a more flexible system throughout than any other mode of transmission permits; (3) the electrical system is ideal, viewed from the standpoint of cleanliness; the stations can be made to occupy a minimum space; the system does not vitiate the air in mine working; and the current used—500 volts—has been proved to be quite free from danger to life. Mr. Selby-Bigge gave an interesting instance of the way in which the benefits of electricity have been illustrated in this State, referring to the mine at Bodie where an electrical power plant has been erected to run a twenty-stamp mill, a full account of which appeared in the last issue of the PRESS.

Electricity in the Manufacture of Armor Plates.

Another modification of great value in the electric welding process has been made in the manufacture of armor plates for battle-ships. In the process of harveyizing plates it has been customary to leave a soft strip along the entire length of the plate, to facilitate the bolting. This left a weak spot, which, in actual warfare, a projectile might pierce at any moment. Now, the electrical current is applied to the plate in such a way that the temper is drawn only at the spot where the bolt is to enter, and the hardness of the rest of the plate is unimpaired.

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SITUATION WANTED BY ENGINEER AND machinist who understands the running and care of electric plants. Engagement preferred with parties interested in the use of electricity for the reduction of refractory ores. WM. H. RUE, 242½ 12th St., San Francisco, Cal.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from G. H. Pease and J. B. Colwell in the North River mine, near Yankee Jims, Placer county, Cal., to impound tailings behind dam in Mexican Gulch; and from the Crown Point Mining Co., in their mine in the Tp. of Goodwin, Plumas county, Cal., to impound tailings behind log and brush dam in Porter Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Dec. 17, 1894, at 1:30 P. M.

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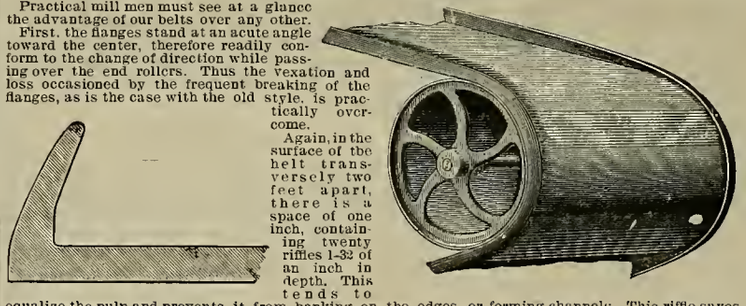

Practical mill men must see at a glance the advantage of our belts over any other. First, the flanges stand at an acute angle toward the center, therefore readily conform to the change of direction while passing over the end rollers. Thus the vexation and loss occasioned by the frequent breaking of the flanges, as is the case with the old style, is practically overcome.

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty riffles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from banking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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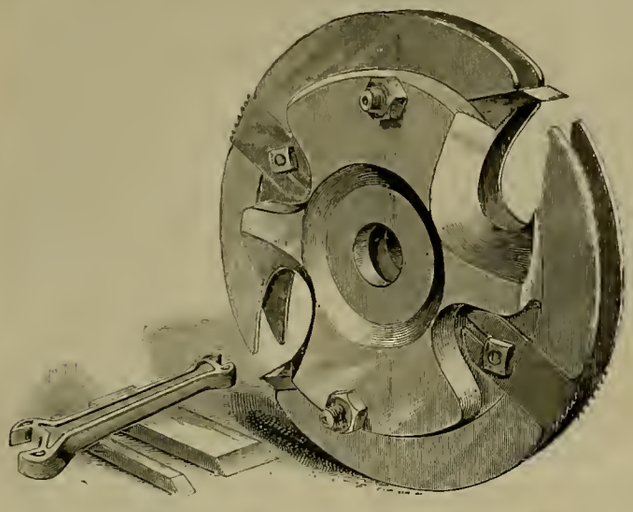
Mechanical Progress.

Wood Working Machinery.

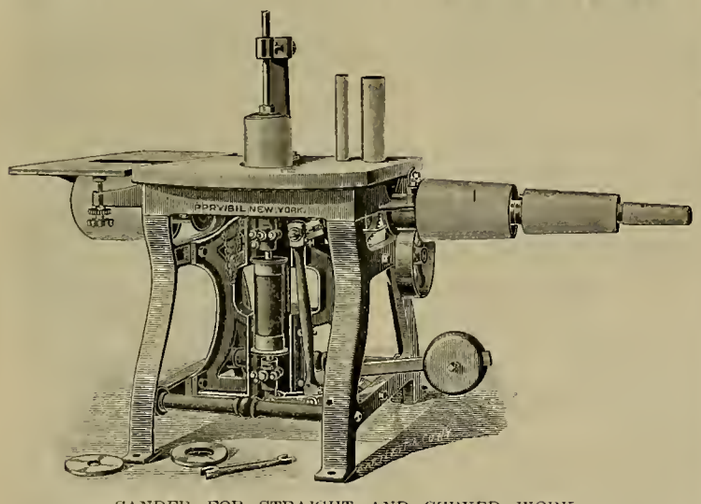
Herewith is illustrated an adjustable grooving head, designed for use with regular saw tables and with a parallel swing-saw machine. With the latter machine it can be very advantageously used with formed knives for moulding pilasters and other work, as well as for tenoning, rabbeting, etc. It is made by P. Pryibil, New York, and consists of two composition brass flanges provided with scoring knives,



PATENT ADJUSTABLE DADO OR GROOVING HEAD.

which can be adjusted to compensate for wear, and with interchangeable routing cutters of a width to correspond with the grooves to be cut. The room required on the arbor between nut and fixed flange (the loose flange being removed) is $1\frac{1}{4}$ for a $\frac{5}{16}$ inch groove, to $2\frac{5}{16}$ for a $1\frac{1}{4}$ inch groove.

The lower cut on this page illustrates a machine designed for sanding both straight and curved work, where it is desirable to preserve square corners, by a vertical drum projecting through a table. Three such drums are provided, $1\frac{1}{2}$, 3 and $5\frac{1}{2}$ inches diameter, each 12 inches long. They have a vertical motion, adjustable from 0 to 8 inches, which provides for using the full face of the drum on shallow work,



SANDER FOR STRAIGHT AND CURVED WORK.

and prevents the formation of ridges and grooves. Flat work is done by a horizontal drum, 12 inches diameter, 12 inches long, over which is a hinged table, provided with a screw for regulating its height. Three free horizontal drums, 8, 5 and 2 inches diameter, each 12 inches long, provide for free-hand work. The drums are covered as follows: Sand paper is cut to templets, and the edges joined by a piece of oil tough paper glued under them. The sand paper is then slightly moisteued and slipped upon the drums, where it dries tight and smooth.

Should the rubber, with which all the drums are covered, be accidentally injured, it can be turned down with a piece of sand paper on a block; or if destroyed, it can be replaced by a piece of carpet. This sander is made by P. Pryibil, New York.

Of the steam engines now working in the world four-fifths have been constructed during the last twenty-five years. France has 79,590 stationary and locomotive boilers, 1850 boat boilers and 7000 locomotives; Germany 59,000 land boilers, 1700 ship boilers and 10,000 locomotives; Austria 12,000 boilers and 2800 locomotives. The working steam engines of the United States represent 7,500,000-horse power, of England 7,000,000-horse power, Germany 4,500,000-horse power, France 3,000,000-horse power, Austria 1,500,000-horse power. This number does not include the locomotives, whose number in the world is 105,000, representing a total of 3,000,000-horse power. The world's steam engines, therefore, aggregate more than 26,000,000-horse power, equivalent, approximately, to the work of 1,000,000,000 men.

Oberlin Smith in the *American Machinist* in an article on "Why Does a Bicycle Stand Up?" answers the question by saying in effect that the center of gravity is maintained in equilibrium by shifting the front or guiding wheel from side to side as circumstances require. It is not a feat of balancing, nor is it due to the wheels trying to "maintain their plane of rotation." When the wheel is in motion the lateral displacement of equilibrium is easily and smoothly overcome by means of the handle bar.

"Timber Preserving Methods and Appliances" was the title of a paper by Mr. W. G. Curtis, read at the regular meeting of the Technical Society in the Academy of Sciences building on the evening of the 7th inst. The system of burnettizing was discussed in a practical way, its economy and utility being recommended. It has been in use on this coast for several months, and is found of great practical value in the preservation of railway ties, etc. A zinc-chloride solution applied to the wood is the principal part of the plan, which also includes a portable plant for lines of road on which the process is in use.

German Ironworkers' Wages.

In the grand duchy of Luxemburg the average earnings of the ordinary workmen amount to less than $200 per annum, and women earn about half this amount. The following is a list of wages paid iron and steel workers:

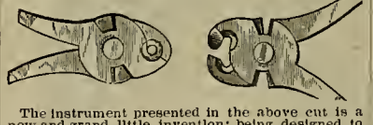
Steel Works—Foreman, $60 and $70 a month; assistant foreman, $1.15 a day; first converter hands, $1.07 a day; second converter hands, 81c a day; third converter hands, 73c a day; first founders, $1.18; second founders, 84c a day; third founders, 76c a day; first basin hands, $1.02 a day; second basin hands, 83c a day; third basin hands, 75c a day; fourth basin hands, 70c a day; first converter machinist, $1.03 a day; second converter machinist, 82c a day; three boys, 45c a day; laborers, 84 cents a day; weighers, $18 a month; smiths, 70c a day; masons, 90c to 95c a day; ingot cleaners, 52c a day; boys, 20c to 50c a day; machinist, 65c to 80c a day; lubricators, 60c a day; overseers, 75c to $1 a day; cupola hands, 60c a day; filters, 52c a day; all other employes, 60c to 80c a day.

Rolling Mills—Foreman, $50 a month; master rollers, $1.88 a day; first roller, $1.46 a day; second roller, $1.06 a day; assistant roller, 82c a day; machinists, 35c to $1 a day; lubricators, 40c a day; laborers, 45c to 53c a day; overseers, $24 a month; all other employes, 35c to $1.88.

Blast Furnaces—Overseers, $20 to $25 a month; chief founders, $1 to $1.40 a day; first founders, $1 a day; second founders, 76c a day; third founders, 69c a day; polisher, 69c a day; crane hands, 55c a day; machinists, 55c to 75c a day; masons, 65c a day; laborers, 60c a day; all other employes, 52c to 70c a day.

The necessaries of life cost as much in central Europe as they do in America. A workman's expenditures for clothing and rent may possibly be somewhat less there than in America, but in the town of Luxemberg coal costs $7 per ton, eggs 21 cents per dozen, rye flour 3, wheat flour 5, sugar 8, butter 25, beef 19, veal and mutton 16 to 20, fresh pork 20, and smoked pork 23 cents per pound.

GIANT POWDER FUSE CAP FASTENER.



The instrument presented in the above cut is a new and grand little invention; being designed to save life and limb, and innumerable lawsuits, by doing away with the dangerous operation of digging out wet and unexploded loads, where Giant Powder is used in mining. The instrument is made of the finest cast steel, and crimps the cap on the end of the fuse *firmly* and *absolutely water tight*. There is also a Fuse Cutter attached. **Price 75c. each.**

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This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on heavy grades, methods of mining shallow and deep placers, history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers, undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water. Price, $5, postpaid For sale by THE DEWEY PUBLISHING CO., 220 Market St., San Francisco.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

JACKSON DISTRICT. — *Ledger:* The new gallows frame at the Argonaut is erected and the building to cover the engines is about completed. The foundation for the engines has been laid in concrete and is ready for the sole plates.

THE ANITA—P. Reichling of the Anita, has ordered timber for a thirty-foot gallows frame, one load of which has arrived upon the ground via Ione. The company has purchased two six-inch engines from Shingle Springs, and will soon have a hoisting plant upon Shoher Hill. The plant they intend to erect will be for the purpose of sinking from 500 to 1000 feet for prospecting purposes. When their mine is found and explored through the proposed shaft, if it is what they hope, a new large three-compartment shaft will he sunk and heavy and substantial hoisting machinery installed.

THE ALMA.—The manager of the Alma has concluded that hand drilling is not so profitable as can he secured with machines in the greenstone in which they are working and has ordered power drills for that mine. They are to he run hy compressed air and the compressor will he upon the ground during this week. He has also ordered two twelve hy sixteen engines for the hoist and upon their arrival will discard the smaller engine now in use.

MIDDLE BAR DISTRICT.—Work at the Vaughn & Kruger mine has been suspended during the rainy weather as they are using a "whip."

CLINTON DISTRICT.—Work is being resumed at the Clinton Consolidated after a cessation of nearly two years. The present determination of the owners of the property is to take the water out of the shaft, which is being done at the present time, and sink 200 more and prospect the ledge at the increased depth.

PLYMOUTH DISTRICT—Workmen have been husy with the hauling of a twenty-stamp mill on the Richmond from the Springfield in El Dorado county. All was on the ground, the timhers framed and workmen ready to commence the erection of the mill, when the recent rains made it necessary to suspend operations for a few days. The Richmond is one of the early day mines of this section and at one time had a 180-foot shaft. Some years ago O. Ball piped off a hank of earth and exposed a body of ledge matter fifty feet wide which can he traced the entire length of the claim. This ledge prospects $25 per ton and as soon as the mill is in running order it will be run upon this rock secured from an open cut.

At the Lucile they are taking out water all the time and have lowered it ahout 200 feet since they started up.

SUTTER CREEK DISTRICT.—*Record:* The consolidation of the Hector and Wildman mines under one management, with Superintendent Ross at the head of affairs, has marked a new era in the mining prospects of this section.

At the Hector mine the water is now helow the 200-foot level. For two weeks past the water has heen raised at the rate of 600,000 each twenty-four hours, or a steady stream running from the sump of thirty-three miners' inches. At this rate the 900-foot level, where the main tunnel will he started to tap the Wildman incline, will be reached within sixty days.

At the Wildman mine all the rock at present heing crushed by its mill of thirty stamps is heing extracted from the 1200 and 600-foot levels. On the 1200-foot level, as the drift is extended south, the ore-body is improving in quality, and in the width of the ore shoot, heing now fully equal to that heretofore taken from the 1300-foot level at the same distance from the shaft.

At the South Eureka over sixteen huudred feet of the drifts and crosscuts have heen run on the 900-level. During this prospecting a solid chimney of ore of more than 300 feet in length, ranging from three to eleven feet in width, has heeu encountered, much of it heing of a very high grade, running up into high value per ton. In addition to this an upraise was made of 120 feet, and the same grade of ore was found to the very top of the upraise. On the 500-level much prospecting was done. The ledge encountered was very large and extensive, but was of low grade, ranging from $2 to $7 per ton.

THE LEONI MINE—Located ou the Leoni ranch, west of Sutter Creek ahout two miles, was lately honded to Eugene Duffy, and a Mr. Johnson, of San Francisco. G. M. Thomas, of Sutter Creek, has taken the contract for sinking the present shaft fifty feet deeper, which will make it one hundred feet in all. The above property is a peculiar formation known as the "Talc helt," lying west of the mother lode and running parallel with it. The material is more like a greasy soapstone than anything else, and will readily crumhle to pieces at the slightest pressure.

Calaveras.

IN CALAVERAS COUNTY.—Mining husiness is recovering all along the mother lode. Calaveras county is getting its share of new capital. The Sau Audreas *Prospect* says the Gottschalk mine near that town has heen sold to Oakland parties. The first installation of the purchase money was paid over Wednesday, of this week, and the second payment will he due in a short time thereafter. The purchasing parties at once commence work upon the property, which has heen sufficiently developed to prove its worth.

Inyo.

MININO DEAL.—*Index.* The sale of a group of gold mines in Snow Canyon to Cleveland, Ohio, capitalists bas heen consummated, and it is expected that the promising property will soon he thoroughly developed and early prove dividend-paying. The Snow Canyon mining sale, it is hoped, portends a new era amongst the thousand and one varied classes of mining interests in the Panamint and Argus ranges, as we understand that the intention of the Eastern capitalists is to place a comprehensive reduction plant capahle of handling all classes of ores.

Nevada.

NEVADA IRON ORE.—*Journal:* P. K. Reid of Lovelock is again making shipments of iron ore to San Francisco parties. Ore from his mines is entirely free from deleterious substances, such as sulphur and phosphorous, and is sought after hy San Francisco men in the manufacture of fine steel. However, the high cost of transportation to the railroad, some sixteen miles hy team, precludes the use of the ore except very sparingly.

The White Cloud Copper Mining Company at Clemens, forty miles from Lovelock, and which have heen closed for several months, intend working their property again, commencing in the early part of January next. The National nickel mines, which have heen closed for some time, will soon resume operations on a large scale. It is the intention of the company to erect a plant for the reduction of the ore on the ground and the shipment of the product in matte to England where a ready market can he found for the same.

A KENNEDY MINE.—The Shamrock Company at Kennedy cut Mammoth ledge in the Union tunnel, which is located on the dividing line to the Gold Note and Morning Star mines. This ledge was cut in their upper tunnel when in 100 feet and was sixteen feet wide, and was a live quartz filled with sulphurets and averaged $18.50 per ton. The Union tunnel is in 350 feet. The vertical distance between the levels of the two tunnels is ninety feet, and the ledge has a pitch of thirty degrees, which would indicate 200 feet of "backs" to the upper tunnel.

Plumas.

THE SUNNYSIDE MINE.—The Sunnyside mine at Butte Valley is heing operated under the management of Col. Day. Twenty men are employed in running tunnels, extracting gravel and doing outside work. New tunnel to the extent of 450 feet has heen run since the new company began work in the summer. They succeeded in "hottoming" the mine, are now taking out pay gravel, and express themselves as well satisfied with the investment.

Siskiyou.

MINING NOTES.—*Journal:* The old Benz Bar mine on Klamath river, near Honolulu, now owned hy a Chinese company, is reported as paying exceedingly rich, and a few more Chinese nabohs will be taking their leave for China when the river mining season closes. No one knows what the Chinese take out, as they seem afraid to tell, but when doing well their return to China is a sure indication of realizing fortunes.

A great amount of mining machinery of latest invention has heen hauled to the Salmon river section lately for the hetter development of the placer, hydraulic and quartz mines. Several companies of moneyed men have purchased mines in that section, and will work them with energy during the coming winter and next spring, while there is an ahundance of water and plenty of snow to keep it up until late in the summer, or all year round, if the winter is not uuusually dry. Several wagon-loads of mining pipe of large size arrived at the Yreka R. R. depot last week for the Columhia mine at Scott river, which is now heing hauled to its destination; also some large giants and other apparatus.

Nine locations have heen made on a quartz ledge in the hills at crossing of Oherlin road leading iuto Shasta valley, near Greenhorn, within a mile of Yreka, the ground having heen taken up for several parties hy Judge Middlemiss of Salt Lake City, with intention of hringing in outside capital to open the claims. The opening of these mines may also develop the strata of blue gravel helieved to exist on the eastern horder of Yreka, and extending from Siskiyou Mountain, via Cottonwood creek, and the western side of Shasta valley, passing along the hase of Butcher Hill and the mountain on east side of Yreka creek.

OREGON.

PLACERS STILL YIELDING.—Baker City *Democrat:* On account of the open condition of tbe weather placer miners are still at work on a small scale, hut the final cleanup for the year is not far off. This has proven a most prosperous season for the miner, the value of the yellow metal taken out of the placers during the run now closing exceeding all expectation and breaking all previous records of production since tbe palmy days of the '60's.

EUREKA'S FAILURE.—Within the last three months the camp has revived to proportions worthy of extended mention. A few years ago Eureka was booming. At one time there were over 500 men employed and the indications were that it would he the greatest camp in Oregon. A large twenty-stamp mill, the finest in the State, was built. Sixty thousand dollars worth of ore was run through it, hut only $7.00 worth of hullion was saved; the rest went down the creek towards the Columbia. This was too much for the average man to stand and the property was closed down, and the camp was soon depopulated. It was all on account of not knowing how to treat the ore. Mining men of experience know how such things happen and may continue to happen in the future. However, it usually results in holding the camp hack a few years until improved methods of treating the ore have heen found and the camp then takes a new era of prosperity.

Last August John Longmaid, of Salt Lake, and J. Henry Longmaid, of Helena, took a four years lease and hond on the Eureka and Elkhorn Consolidated gold mine, and have been working the ore into concentrates which they are shipping to Tacoma smelters. Thirty-six men are now employed and they expect to increase the force as fast as the work will justify it. They are now milling thirty tons daily. Preparations are being made to increase the capacity hy putting in six more vanners and a roasting plant.

A 120-foot shaft will he sunk and hoisting works put in and drifting on the ledge from the bottom of the shaft will he pushed as fast as possible.

The mine is now worked through two 800-foot tunnels, and several hundred feet of stopes have been opened up. Mr. Longmaid states that it is his intention to work the ore hy the cyanide process, which he finds the hest adapted to the kind of ore they are now taking out. By this time next year he expects to furnish employment for 200 men.

The North Pole mine has closed down for the winter. Dr. Henry Leipman, representing the London syndicate who control the property, states that work will be resumed next year and that their mill will be fitted up with the cyanide process and active operations commenced. The results ohtained from a test made with his process have heen such as to warrant the statement that the property would pay a handsome dividend.

Eureka is about thirty-five miles west of Baker City and twelve miles from McEwen, the terminus of the Sumpter Valley railroad. It is destined to be a valuable feeder to Baker City, which is fast hecoming the recognized mining center for a large portion of Oregon.

SALE OF THE COPPER KING.—The La Grande *Chronicle* is told that a deal is on foot for the sale of the Copper King, the famous copper mine in that locality, and also Gilkison Bros.' mine, to a syndicate of capitalists of Salt Lake City and Philadelphia. Some time ago a carload of sample ore was shipped to Salt Lake and met with approval from the prospective purchasers. A son of Brigham Young, who is interested in the purchase, is now at North Powder, together with other capitalists. The sale of the Copper King and the large development that would surely follow would make a hoom in tbe North Powder mining country.

WASHINGTON.

TACOMA SMELTER.—Following is the secretary's report of the Tacoma smelter's operations for November:

Bullion shipped..... 3600 bars weighing 373,453 lbs.

Contents—	Value.
1,554.30 ozs. gold at $20 67 ...	$32,127 38
25,432.86 ozs. silver at 63c ...	16,022 70
371,607 lbs. lead at $3 per cwt ...	11,148 21
Total ...	$59,298 29

Number of men employed, 64.

Pay roll ...	$5,181 66
Wood choppers and teams ...	434 00
Total ...	$5,615 66

MINING DEAL CLOSED.—Loomiston *Journal:* J. H. Redman closed a deal for the Little Falls mining property on Cecil creek; consideration $7000. The property has heen hought hy Waupon, Wis., parties.

BRITISH COLUMBIA.

BETTER TIMES.—"Considerahle now capital has come into the Cariboo country this year," says A. McLeod. "For example, a Montreal company has just paid $75,000 cash for the Victoria Company's claims on Canal river and gives them an interest in the property hesides. They propose to do considerable work next year.

"The Horsefly claim had a small cleanup this fall, taking out about $9000 in gold, and has its plant ready to hegin hydraulic mining in the spring. Hohson is manager for this company and also for another owning claims on Canal river. He has had 300 men at work all summer cutting ditches, and will he ready to take out a large amount of gold next season.

"Other claims are heginning to interest capital—there are even plans for reworking old fields that paid so richly in the early days. In short, capital is getting into that country, and it may not be long till the Cariboo district takes its old place among the hig gold camps."

MINING IN THE BIG BEND.—The Big Bend gold country in British Columbia is situated on the Columhia river, about seventy miles north of Revelstoke. The season just passed has been none too prosperous for the gold hunters in that country. Heavy and oft-recurring floods have had a bad effect, keeping hack active operations and retarding the packing in of supplies. The claims heing worked center principally upon the Goldstream and its tributaries, and of these notably French and McCullough creeks, while a small number of Chinamen have washed the bars of the Columhia.

The greatest loss to any property was that to the Consolation, which suffered great damage during the heavy floods last June. The wreck has all heen cleared away, new buildings put up and the owners are now making good headway with their drifting. The Nestelle Company has a hig claim on French creek, and has already expended several thousands of dollars in opening up its property in a proper manner.

Forty-nine men will spend the winter in the Big Bend, sufficient supp ies having heen packed in to last them until spring. A correspondent estimates the gold output of that section for this year as follows: Frencb creek $17,000, Goldstream $3500, Sol Haiden claim $2000, McCulloch creek $500, Carne's creek $300, hars of Columhia river $300, Smith creek $200; total, $23,800. The Chinese who have heen working all summer on the bars of the river are loth to make a report of their labors, and it is just possihle that they have cleaned up more than they are credited with in the report. The most taken out of any one claim was from the Consolation on French creek. The amount was $10,000. The Big Bend is a camp of deep diggings, and it costs money to make the yellow metal loosen its hold on the hedrock. It is expected that next year the claims will he worked more extensively than at any time since 1865.

IDAHO.

REVIVAL OF A GOLD CAMP. — Salt Lake *Tribune:* The reports from the Yellow Jacket mining camp, seventy-five miles north of Challis, Idaho, indicated that a new hoom has landed there. As long since as the early sixties the gold quartz of this camp was worked hy primitive reduction methods, hut the heavy fissures were never thoroughly prospected, and the camp was finally ahandoned.

Now the camp contains over 300 men, the Yellow Jacket Gold Mining Company and the Columbia Hill Company are each putting in heavy licks on their gold quartz properties, while Pinney & Fox are constructing a flume one and a half miles to carry water for hydraulic mining in the rich placers of the gulch. Winter has commenced to close down the reduction husiness, hut it is confidently believed that spring will see 1000 men in the camp.

The Yellow Jacket Company have just completed the construction of a large frame structure for a forty-stamp mill, at an altitude of 6000 feet, and 2000 feet lower than the mine. Over 300,000 feet of lumher was used in the construction of the mill, every foot of which, and the lumber in the placer flume, together with that in the new mill of tbe Columbia Hill Company, was sawed on the ground hy sawmills operated by water power. The gold quartz is a free milling proposition and averages $12 to the ton. The placers of the gulches have never heen developed until the last two years, but Pinney & Fox elaim now that their limit is the limit of the gravel in sight, and until that is exhausted Yellow Jacket will be a good placer camp.

LOW-GRADE GOLD ORE.—A Centerville correspondent of the Idaho City *World* says: "I don't want to excite anyhody nor seem extravagant, but I want the world to know that Centerville has more low-grade gold ore witbin a radius of five miles than any known camp on the coast to-day. We have two or more reefs of ore that will average from $2 to $8 per ton, which, allowing a depth of 100 feet, will yield 20,000,000 tons. I think, from personal observation, that I am making a reasonable statement, and if anybody doubts it let him come and see. These reefs are yet unexplored, the deepest hole being twenty-six feet. This hole, however, if it proves anything, proves that the ore gets better with depth."

UNTOWARD CIRCUMSTANCES.—There has been a general exodus from Wardner during the past few days, says a dispatch; about twenty men have gone to California and nearly 200 bave scattered to different parts of the Northwest, many of them taking their families with them. Nearly twenty trunks were carried to the depot, and others are preparing to leave. There is no doubt that the closing of the Bunker Hill and Sullivan mine hy Manager Bradley meant a winter without work for Wardner's families. The buckets have been taken off the tramway and things are heing fixed up and laid away for a long season of idleness. Both sides are adhering to their plans and the merchants and property owners are greatly discouraged over the outlook.

MONTANA.

MINING NOTES.—Anaconda *Recorder:* Copper has been discovered in Prickly Pear canyon near Great Falls. The *Madisonian* reports that Engineer James McFarlane of Butte has purchased the Aurora Borealis mines near Silver Star for J. B. Haggin and tbat a payment of $10,000 was made.

Since the reports have gone forth of the resumption of work at the Combination and Bi-Metallic mines, there has been a heavy influx of miners to Phillipsburg. In one day 150 tickets were sold in Butte and 30 in Anaconda.

J. K. Clark of the Moulton mine in Butte is authority for the statement that not enough custom ore is being mined in Butte to keep one quartz mill husy.

The ore bins of the Anaconda mines in Butte hold ore enough to fill a train of forty cars.

Review: The Morning Star mine is located in the city of Butte and has produced over $250,000. Although the property is only 200 feet wide there are four well defined veins upon it, and a shaft has been sunk to a depth of 300 feet. The ore chute on tbe 300-foot level will average two and one-half feet of ore that will mill 28 ounces of silver and $8 in gold and from 3 to 4 per cent in copper. The ore chute is at least 175 feet in length, and it is said that a company is under formation to work this property on an extensive scale.

SOUTH DAKOTA.

GOLD MINING IN BLACK HILLS.—The Black Hills *Times* says that the Omaha-Grant Smelting and Refining Company has joined the Homestake and the Deadwood and Delaware Companies in the establishment of a smelter in that district for the purpose of treating concentrates, of which the Homestake Company has a large supply on hand. "The enterprise," says the *Times*, "will he sustained by capital enough to make everything first-class and complete. The hackers are men of great means and valuable experience, who will make an unqualified success of it. It is hardly likely that anything will be done this winter, hut steps will he inaugurated very early in the spring and the project pushed forward very rapidly."

The amount of gold ore at present mined and milled is the largest in the history of the camp.

The Black Hills district received a severe set-back when the surface ore was exhausted. It now has four methods of treatment in successful operation, which accounts for the steady dividends from the leading mines. These metbods are milling, smelting, chlorination and cyanide. The mills are handling 3,000 tons of ore per day. At the Golden Reward chlorination works, from 120 to 130

tons per day are treated, while the new cyanide plant of the company is calculated for 200 tons per day. The pyritic smelter owned by the Deadwood and Delaware Company has a capacity for 100 tons per day, and the cyanide plant of the Black Hills Gold and Silver Extraction Company is being increased from fifty to seventy-five tons per day, equal in size to the cyanide plant at Cripple Creek.

With a capacity for ore treatment equal to 3,500 tons daily, only a portion of the mines in the district are as yet producers. Cheaper and more successful treatment will gradually induce others to develop, until the Black Hills district will take a front rank among the successful producers of gold. This may all be credited to the metallurgical advance of the last two years.

NEVADA.

ESMERALDA COUNTY.—In Silver Star district six hundred tons of ore that will mill $30 to the ton are on the dumps of the different claims. The five-stamp mill has turned out $15,000 in the two months it has been running on half time. Twenty-five men are working for wages in the district, and about thirty more are leasers.

ARIZONA.

Gazette:—At the Kincaid mine, near the Hassayampa, Kincaid's claim at a depth of fifty feet has opened out to a four-foot streak of $15 free-milling gold ore. Kincaid, J. C. Rankin, and two Chicago parties some time ago, when the pay streak only averaged twenty inches, refused $10,000 for their half interest. It is believed that the new strikes raise the mine to a $40,000 proposition. The property is only two miles from the Hassayampa and the new railroad.

LOOSE MINING LAWS.—*Journal Miner*: Colorado miners, who have been driven to this section, complain of the loose mining laws in force in this territory, which permit a man to locate and hold a claim and relocate and still hold it without doing any work on it. It is said that in some districts as many as a score or more of claims are held by a single individual who has never done any work on them, and that nearly every district is cursed with monuments, plastered over with location notices, but no work done on the claims. This is simply a dog-in-the-manger way of doing business. The locator is not benefited, as it is impossible for him to sell an undeveloped claim, and the country is held back in its development, as genuine prospectors who would be willing to develop these claims would take hold of them if they were not already held by others. In Colorado a prospector is compelled to sink a given number of feet after locating his claim, before he can record it, and Colorado miners say that this law gives good satisfaction.

COLORADO.

DEEP MINING MACHINERY.—Boulder *News*: Quite a number of mines in the country, during the present season, have been putting in machinery for deep mining. One great trouble heretofore has been that the mines have only been scratched over. With such machinery as the Revenue, Utica, Pine Shade and others now have, it will be possible to carry on the work in a manner that will not excite the ridicule of those accustomed to great mining operations carried on in a scientific manner.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DEC. 4, 1894.

530,381.—BREAKDOWN GUN—M. S. Barker, Eugene, Ogn.
530,344.—DENTAL ENGINE—J. A. & B. A. Jeffery, S. F.
530,347.—VOTING MACHINE—J. Mourot, Modesto, Cal.
530,241.—DUMPING WAGON—J. C. Proctor, Dallas, Ogn.
530,251.—BUGGY SHAFT—H. G. Vaughan, S. F.
530,252.—NAIL SET—C. G. White, Woodland, Cal.
530,375.—ROTATING MOTOR—W. H. Willey, Santa Monica, Cal.
530,149.—COFFEE PERCOLATOR—H. Wilson, Indian Diggings, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

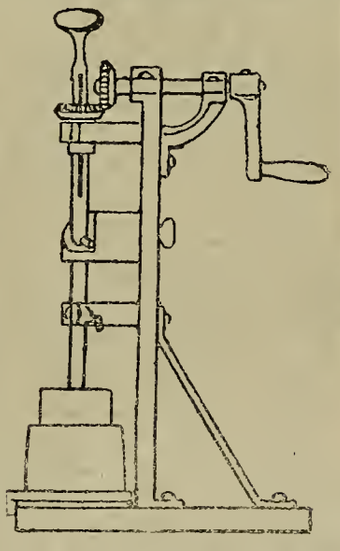
ELECTRIC DENTAL ENGINE.—Joseph A. Jeffery and Benjamin A. Jeffery, San Francisco. No. 530,344. Dated Dec. 4, 1894. This invention relates to a dental electric engine. The object of the invention is to provide an improved means for supporting and adjusting the motor so that it may be turned to any desired position for application of its power, means for reducing the noise and vibration caused by its rapid rotation, to provide an improved means for reversing the motor and for connecting and disconnecting the drive shaft. The motor is swiveled upon a bracket which is secured to the wall or other suitable point projecting and turnable about its points of attachment, so that the motor can be swung around in an arc of a circle, the size of which depends on the length of the bracket. A switch mechanism is fixed near the bracket and suitable connections made through or along the bracket to the motor, this switch being actuated by a foot lever within convenient reach of the operator, so that the motor may be reversed at any time with little difficulty. A two-part shaft is employed, the motor armature rotating within its case upon one portion, while the other portion extends outwardly in line with it, and an electro-magnet is fixed to and turnable with the motor armature, while a disk armature revoluble with and movable longitudinally on the shaft of the motor serves to connect the two when the electro-magnet is energized so as to attract the clutch armature to itself, and is disengaged whenever the current is cut off and the electro-magnet de-energized.

VOTING MACHINE.—Julien Mourot, Modesto, Cal. No. 530,347. Dated Dec. 4, 1894. This invention relates to a machine by which votes may be cast for any number of persons, and the number of votes cast for each and all the candidates are automatically registered and indicated. The objects of the invention are, first, to construct a machine which will automatically register the number of votes cast in favor of any or all candidates seeking election, at the same time indicating the number of electors who have cast their ballots; second, to so construct the machine that only the party voting will know for which candidates he has cast his ballot; third, to render it impossible to tamper with the poll; and fourth, to prevent an elector voting more than once for the same candidate or for more candidates than he is entitled to. The machine is constructed to operate upon what is known as the "Australian Ballot System," and is provided with a series of depression levers or pitmen, tapes or numbered carriers, and drums upon which the tapes are coiled, mechanism by which the numbered carriers are advanced a single figure by the depression of each of the levers so as to indicate an additional vote, and a locking mechanism to lock all of the levers and render them inactive after a single operation by each voter.

To Crush Samples of Ore.

There is always a demand among assayers, miners and prospectors for a simple, strong and easily portable machine that would grind samples of ore to a very fine powder in a few minutes, in order to obtain an immediate analysis of specimens. The old "iron mortar and pestle" and "iron plate and flat hammer" methods are laborious and require special skill in order to yield the right results.

A machine has been invented, which is herewith illustrated, in which, by means of a crank and bevel gear, rotary motion is imparted to an upright shaft, terminating above in a knob and below in a stout pestle, which is inserted in a mortar. This rod has a vertical play in the hub of the horizontal gear-wheel, but a projecting feather along its side, extending into a slot in the wheel, compels it to revolve when the wheel does. The spiral



track, on a bracket through which this shaft extends, lifts the latter a short distance with every revolution, and then drops it abruptly. Thus the coarser work of crushing is done as in a stamp-mill. But when it is desirable to reduce the product to a fine powder, this bracket is lowered by releasing a thumbscrew, and then the pestle merely goes round and round, resting down in the mortar. The latter may be removed easily from is position, if the operator first lifts the vertical shaft by its knob. A machine of this type, about eighteen inches high, is capable of delivering a sixteen-pound blow. By a slight adjustment, the force of this stroke may be doubled. Of course the design may be reproduced in any size.

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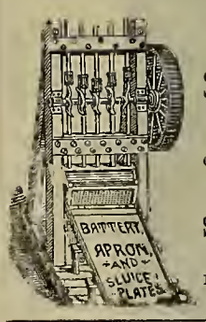

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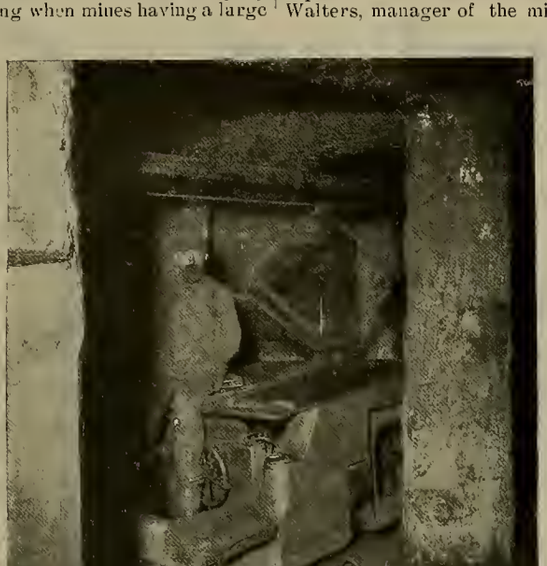
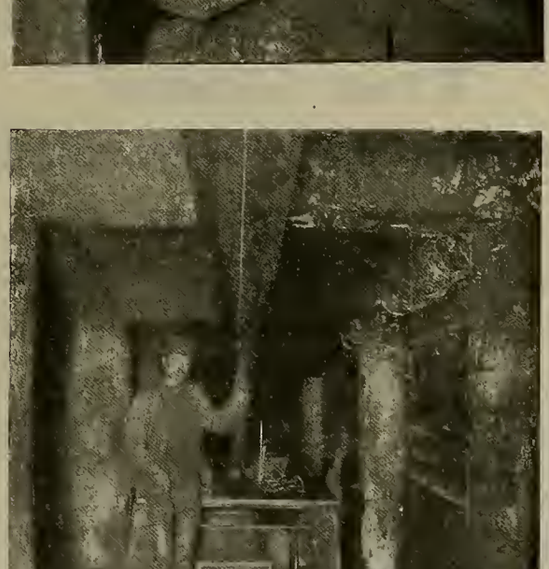
Electrical Progress.

Electric Haulage in a Michigan Mine.

The use of the electric locomotive in mine haulage work becomes daily more widespread as the advautagc inscparable from the adoption of electricity in mines becomes better recognized. In coal and iron mines they are steadily supplanting the rope systems and mule haulage, and the time seems rapidly approaching when mines having a large





output will gencrally adopt electric power for this purpose.

About two years ago the Pittsburg & Lake Angeline Iron Mining Co. determiued to install an elcctric plant, after having become convinced of the economy of the step. At the surface a power-house was constructed, and a 14x30 Reynolds-Corliss engine erected to drive a D-62 500-volt general electric bi-polar geuerator. Armored mains are taken down the mine on porcelain insulators, and connected in the usual manner to the trolley wire and track.

The haulage plant proper consists of two general electric T. M. M.-14, 30-inch gauge locomotives, each being equipped with two motors. The locomotives are capable of exerting a draw bar pull of 1500 pounds each, at a speed of from six to eight miles an hour. The motors are of the iron-clad waterproof type.

The length of haul is somewhat short for locomotives, but is too long for profitable tramming by meu, the distance averaging from 250 to 1400 feet.

The grade is 8 inches in 100 feet, in favor of the loaded cars, and the curves are sharp, varying from twelve fcet radius up on account of the narrow veins. No scrious delay has occurred since the plant began operation.

The cost of hauling at the present rate of workiug, which is not up to the capacity of the locomotives, is two cents per ton, including oil, waste and repairs. In a letter from Captain Walters, manager of the minc, referring to this cost, he says:

"This is per tou on the ore hoisted. Extra to this, we close timber all our ground. The timber is hauled arouud aud left with each party of contractors in turu. I should say here that I have put in no percentage for the first cost or outlay. If I had to do this work by hand, as we used to do, I would have been delighted to set a contract in the mine to have the ore trammed and timber delivered at places needed at eight cents per ton for ores hoisted."

Writing to the *Electrical Engineer* of New York, Professor Elihu Thomson states that in 1882 the succeeded in converting ordinary carbon rods completely into graphite by passing very heavy electric currents through them. His patent application was, however, unfavorably received by the patent office, and he abandoued the matter, though hc still believes that, with cheaper power, graphite of fine quality cau be made artificially on a considerable scale.

Electric Conduit Railway.

At a recent meeting in New York for the purpose of discussing the feasibility of the electric conduit railway, the question beiug of present importance to San Francisco, Joseph Sachs put the whole thing in a nutshell in the statemeut that the crux of the electric conduit situation was not "Can it be built?" but "What will it cost?" The lowest cost, as very carefully estimated, can be put at $30,000 or $40,000 a mile, single track. Even this estimate is not for the best construction, and does not take into account difficulties arising from pipes, sewers, etc. There could be no comparison between the conduit and the trolley. The trolley has been of enormous value in the ten years of its life, and it will remaiu supreme in its owu field. There is little prospect of a couduit system ever being put in as cheaply as the trolley, and this fact will rctard the adoption of the conduit in many of the largest cities. In cities where the trolley is forbidden, an underground, or conduit system, will be the next natural evolution, and that developments in that direction are not far off is shown by the fact that three important corporations are now testing the ordinary open-slot conduit, and, so far, with reassuring results. The point to aim at in a conduit system, and the attainmeut of it will do more to bring the system into favor than anything else, it is to secure absolute simplicity by getting thc mechanism down to the simplest forms and fewest parts, so that it can always be gotten at readily and easily repaired. An interesting point in the discussion was brought out by C. B. Fairchild, a well-known authority on street railroads. He said it was a qucstion with many peoplc whether there is any imperativc dcmand for an uudergrouud system. The matter has been studied quite thoroughly, and some of the large electric companies have made designs for an underground system. One of these companies which proposed to put in such a system in New York, underwent an entire change of heart. After studyiug it they concluded that a successful underground system would be a calamity for the street railway interests, rcasoning that if oue were adopted, every little city throughout the country would demand that all the wires be put underground, and that would mean ruin to nine-tenths of the street railways of the country. Mr. Fairchild mentioued this, not as an opinion, but as iudicating what the feeling in regard to the conduit was in street railway circles. He also stated that the great difficulty in the underground system in this country has been with the moisturc and gas that collects in the conduit. When he was studying the system two years ago, thcre were certain times when it was impossible to tell what became of the current. Perhaps the car would run all day without any difficulty, everything being all right. As soon as it began to run next day the current would be gonc, and they would hunt for an hour or two and not fiud it. Presently it would comc back, and the cars would run as if nothing had happened. How that current went away he never knew, and he never heard any explanation of it. It seemed to go through the gas or moisture that accumulated in the conduit, which has special and most peculiar characteristics. It is a good conductor, but beyond that, engiueers seemed to know nothing about it. The general belief in electrical circles now is that for heavy traffic, under certain conditions, the conduit is the coming system for street railway work in large cities. It may raise difficulties with some of the companies that have a clause in their frauchise compelling them to put in an electric conduit when one proved to be a success has appcared. Under such conditions it might be as inconvenient to the company as it would be desirable for the public, but this would not hinder its adoption.

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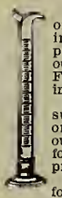

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Practical Information.

Cost of Bread.

In view of the demand for cheaper bread, begun at a number of cities, the Agricultural Department has given out a bulletin on the "cost of bread," taken from the forthcoming report of Prof. W. O. Atwater on the nutritive value of foods. It says:

"In practice 100 pounds of flour will make from 133 to 137 pounds of bread, an average being about 136 pounds. Flour, such as is used by bakers, is now purchased in the Eastern States at not over $4 per barrel. This would make the cost of flour in a pound of bread about 1½ cents. Allowing one-half cent for the shortening and salt, which is certainly very liberal, the materials for a pound of bread would cost not more than two cents. Of course, there should be added to this the cost of labor, rent, interest on investment, expense of selling, etc., to make the actual cost to the baker.

"Very few accurate weighings and analysis of bakers' bread have been made in this country, so far as I am aware; but the above statements represent the facts as nearly as I have been able to obtain them. The average weight of a number of specimens of ten-cent loaves purchased in Middletown, Ct., was but one and one-fourth pound. This makes the price to the consumer eight cents per pound. The price of bread and the size of the loaf are practically the same now as when flour was twice as much.

"The cost of bakers' bread is a comparatively small matter to the person who buys only a loaf now and then, but in the Eastern States and in the larger towns throughout the country, many people, and especially those with moderate incomes and the poor, buy their bread of the baker. Six cents a pound, or even half of that amount for the manufacturer and distribution, seems a very large amount.

"In the large cities competition has made bread much cheaper, but even there the difference between the cost of bread to the well-to-do family, who bake it themselves, and to the family of the poor man, who buy it of the baker, is unfortunately large.

"The report also goes into the chemistry and scientific features of bread making. The nutrients in bakers' bread are: Protein, 9 per cent; fats, 2; carbohydrates, 56; mineral matter, 1; total, 68 per cent nutrients and 32 per cent water. In wheat flour the total nutrients are 88 per cent and water 12 per cent, showing that the nutrients are largely reduced by baking. The potential energy in a pound of flour is 2000 per cent and in a pound of bakers' bread 1300 per cent. With the increase in the proportion of water in the bread as compared with the flour, the proportionate nutrient is diminished, but the addition of shortening and salts brings up the fat and minerals in the bread, so that the proportions are larger than in the flour."

Leather Belts.

No one using leather belts can afford to be indifferent to their care. There is a certain amount of elasticity in all good leather belting, but time and continued hard work seem to destroy or at least weaken its power. Then comes the question whether it is better to simply tighten the belt or use some form of dressing. Experience of many very practical observers seems to favor the use of good dressing, as tightening the belt strains it and calls for more engine power. A dynamo engineer who is transmitting 60 to 65-horse power, with a 50-foot link belt eight inches wide, running from a 72-inch pulley on driving shaft to a 13-inch pulley on dynamo, claims that freedom from jumping and flickering of the lights is due entirely to the belt dressing used, and that tightening never helped. The superintendent of a large printing establishment has an 18-inch main belt now running its eighth year which has never been taken up, and it would be extremely hard to convince him that the dressing used does not preserve the life of the leather and keep it soft and elastic. Of course one should be careful what sort of dressing is used. Soap, rosin, tar and tallow should not be used at all. Even castor oil is criticised.

Findlay Natural Gas Going Out.

At Findlay, Ohio, the Creighton gas well which a year ago had a rock pressure of 180 pounds is now down to nineteen pounds. In the Marion township field, east of Findlay, where a few years ago the great Thornton well furnished enough gas to supply Tiffin, twenty-eight miles away, the pressure has gradually fallen until the two best wells—the Ross and the Sparks—show a pressure of only nine pounds, and the gas is unable to propel itself along the mains which lead to the city. An even more deplorable condition exists in the great Stuartsville field, four miles north of the city. Here was the center of the great Ohio gas field. For years this territory was used to supply Findlay, Toledo, Detroit, Saudusky, Fremont and other cities. Now the pumping stations of great corporations are at work sucking air and trying to keep up a semblance of furnishing gas. During the mild weather there is an abundance of gas for domestic consumption, and during the past summer the factories have been supplied; but when the first frosty morning came, down went the blaze in every store. People are reluctantly going back to the use of coal and wood, and the fuel dealers and stove men are driven to keep up with the demands made upon them.

No. 10.

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Robt Duncan Jr Supt

OFFICE OF
ALASKA TREADWELL GOLD MINING COMPANY
Alaska Mexican Gold M'g. Co.

Douglas Island, Alaska July 31st. 189.

William J. Chalmers Esqr.
Pres. Fraser & Chalmers.
Chicago. Ill.

Dear Sir:-

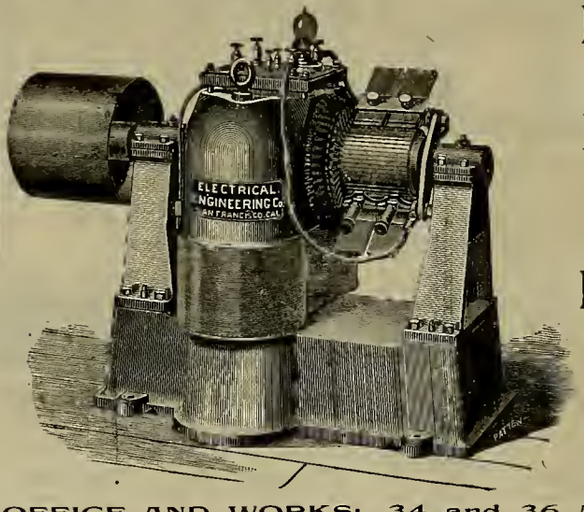
Your letter of July 7th. is duly received.

In regard to your enquiry regarding our Riedler Compressor, supplied by your Coy, over eight months ago, I must say, that the Compressor is giving excellent results, and every satisfaction, while running either by steam, or water power.

During the last twelve years, I have seen operated, and have operated, many different makes of air Compressors, including the Eclipse, Reliance, Burleigh, National, Rix, & Firth, Ingersoll Sargent, etc. etc. and in no instance, have any of the above given the results of the Riedler. Therefore, I have no hesitation in saying that the Riedler, is the best, and most economical Compressor on the market today. We have made comparitive tests here, of the Ingersol Sargent, and Riedler, which show, greatly in favour of the Riedler.

Yours very truly.

Robt Duncan Jr.
Supt.



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Market Reports.

The Markets.

SAN FRANCISCO, Dec. 13, 1894.

Silver still suffers an eclipse, and all the work, expense and risk involved in silver mining, if continued, can hope for no present profit. Anything under 65 cents an ounce means loss, except in most rare cases where the ore is of extraordinary richness or other favorable circumstances. So far this year China has taken $7,000,000 more silver from London than in '93, and the assumption is that should Japan insist on the demand of a war indemnity of 400,000,000 yen, silver would be the metal of payment, which would cause an immediate raise; but the amount is problematical. It would seem that administrative juggling with the issue of bonds has more to do with the present slump in silver than anything else.

The coining of standard silver dollars has been discontinued. During the spasmodic ante-election effort in that direction about $3,000,000 were coined.

The syndicate that bought the recent issue of $50,000,000 Government bonds clears $1,200,000 on the transaction. The clever purchase was made at a little over 1.17. They are now held at 1.19¼. It is thought better financial methods on the part of the U. S. Secretary of the Treasury could have secured that top figure as readily as private parties, as it is the pledge and faith of the Government which makes them worth that.

During November 2190 flasks of quicksilver were sent from here by sea. For eleven months of '94 the shipments aggregate 14,845 flasks, worth $458,162. For the same part of '93 the shipments were 13,400 flasks, worth $534,814.

New York Prices.

NEW YORK, Dec. 13.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	28⅛	61¾	9 50	3 05
Saturday	28¼	61⅝	9 40	3 05
Monday	28⅛	61	....	3 05
Tuesday	27¾	60½	9 40	3 05
Wednesday	27¾	60¾	....	.....
Thursday	27⅝	60⅞	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½
New York Telegraphic Transfer	10c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89½
Refined Silver, per ounce	60
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6⅝
Powdered, "	—	@	6⅝
Concentrated, "	—	@	6¼
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	4 75	@	5 00
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Per lb	16¾	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 25
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 25
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Grsta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 00
Wallsend			7 00
Scotch Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 65	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 37½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

—The General Electrical Company, which has the contract for carrying the electric current from Folsom dam to Sacramento City for use for power, light and heat, has sublet the contract for poles, and work on the line is to be commenced at once. The line will be twenty miles, the longest transmission line in the world. A double row of poles will be used, each carrying sixteen copper wires. The dam and canal are already completed and work is being pushed an the power house.

—The new line of the Postal Telegraph Cable Co. follows the routes of the Santa Fe and A. & P. Railroads.

Mining Share Market.

SAN FRANCISCO, Dec. 13, 1894.

The week has been a light one in every way, aud '94 will apparently go out in gloom. Meanwhile the mines themselves show an improved condition. The absence of anything like big money is the chief complaint on the street, cents having taken the place of dollars.

The Comstock Tunnel Co. has effected a compromise and settlement of all its legal difficulties and expects to make a good financial showing in '95.

During the month California mines ask for $22,500 in assessments, and Nevada mines $153,620, of which amount the Comstock represents $133,620.

The Con. Cal. & Va. miue pays a 25-cent dividend next Monday. During November the report shows 1647 tons of ore were worked, yielding $51,843 gold and $49,365 silver. This is an average of $61.44; the battery assays showed $76.59—a loss of over $15 per ton. That would make a pretty good dividend itself.

The following illustrates the changes of the week:

MINES.	6	13
Alpha	.....	.....
Alta Consolidated	$ 22	$ 21
Andes	.....	38
Belcher	65	68
Best & Belcher	62	89
Bodie	55	65
Bullion	.....	18
Challenge	36	39
Chollar	52	49
Confidence	.....	85
Consolidated California and Virginia	3 55	3 80
Consolidated New York	.....	02
Crown Point	55	68
Exchequer	.....	04
Gould & Curry	40	40
Hale & Norcross	91	.....
Justice	25	20
Mexican	60	62
Ophir	1 75	1 75
Overman	10	.....
Potosi	40	36
Savage	.....	.....
Sierra Nevada	.....	.....
Union	36	34
Utah	07	.....
Yellow Jacket	48	41

Coast Industrial Notes.

—The Tacoma Mill Company is furnishing 250 employes with ten hours' work daily.

—A car works is to be built at Seattle, Wash., with a capital stock of $1,000,000.

—The Piedmont branch of the Oakland street railway system is to have an electrical equipment.

—L. C. Pressley of this city has been granted a patent, No. 529,846, for a conduit electric railway.

—Mr. Bishop, of the Pacific Power Co., has bought a 115-kilowatt multipolar 500-volt generator for his power plant.

—The Electric Light Co. at Sisson has changed hands, and is now run by the Wickham Bros., who have reduced the rates.

—An electric railway along the ocean beach for a distance of two miles southward from the Cliff House, is the latest project of the Market St. Railway Co.

—One lot of 31,364 bushels of blue stem wheat has just been sold at Lewiston, Idaho, for 31.80 cents per bushel. It will be shipped to an exporting firm at Portland.

—The travertine quarry near Bridgeport has been sold by its discoverer, W. E. Lindsay, to a San Francisco company. The property will be developed next spring.

—Four more British Columbia salmon canneries have been sold to an English syndicate—the Lighthouse cannery on the Fraser, two on the Naas river and one on the Skeena: $30,000 was paid for the former.

—The Washington Cedar Company has incorporated at Seattle, capital stock $300,000, to lease all the shingle mills in the State of Washingtou, numbering 234, with the intention of controlling the red cedar shingle trade.

—A new fuel to supplant dear coal is proposed in the mixture of Santa Barbara asphaltum and peat from the vicinity of Lake Tulare, both materials existing in apparently inexhaustible quantities. The projectors figure that they can supply fuel satisfactory for every purpose for $3 a ton. R. H. Coe, of Boston, is investigating the subject.

—The Oakland Iron Works, recently partly destroyed by fire, will be rebuilt. A shop 100x100, all under one roof, will be divided into three parts by the columns sustaiuing the roof. There will be a traveling crane in each, capable of holding any piece of machinery or material not over twenty-two feet high and not weighing more than fifteen tous.

—The South Yuba Water Company asks Sacramento for a franchise to bring in electric energy for power, light aud heat into that city from the power site at Newcastle, thirty miles distant. This company is now installing plants for lighting Auburn, Rocklin, Newcastle and Penryn with electricity and claims to be able to furnish 4500 horse power for Sacramento.

—What is believed to be the largest plow in the world is owned by Richard Gird, of Chino, Cal. This immense sod turner stands eighteen feet high and weighs 36,000 pounds. It runs by steam, is provided with twelve 12-inch plowshares aud is capable of plowing fifty acres of land per day. It consumes from one to one and a half tons of coal per day, and usually travels at the rate of four miles an hour.

—The United States battle ship Monterey left the harbor of Fairhaven recently, when she lay at anchor 600 yards from a coal dock, and sailed up Puget Sound fifty or sixty miles to fill her bunkers with Canadian coal from the Comox mine, near Vancouver, because she could get it $1 a ton cheaper than on this side of the border. Why? Because the Dominion coal is mined by Chinamen who are paid $1 a day. The Fairhaven coal is mined by white men who demand $3.

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 13, 1894.

9:30 A. M. SESSIONS,

100 Andes	38	250	68
100 Belcher	65	200 Exchequer	04
250 Best & Belcher	84	50 G & C	40
500 Bodie	65	900 Kentuck	02
300 Bullion	18	200 Mexican	61
100 Caledonia	10	100	62
100 Challenge	39	100 Ophir	1 70
600 Con Cal & Va	3 70	600 Seg Belcher	19
200 Con New York	02	50 Union	34
500 Crown Point	67	100 Yellow Jacket	39
20	65		

SECOND SESSION—2: 30 P. M.

100 Ophir	1 75	100	35
400 Mexican	64	100	36
100 Gould & Curry	39	100 Crown Point	67
100 Best & Belcher	86	30	65
400	89	1000	68
100	87	00 Bullion	18
100	88	250 Yellow Jacket	41
200 C. C. V	3 89	30	38
100	3 75	450 Justice	20
500 Belcher	68	300	19
25 Cbollar	45	100 Union	33
50	49	650	32
100	41	200 Alta	21
30 Potosi	30	40 Confidence	85

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Patents secured in the United States, Canada, Mexico, all British colonies and provinces, England and other civilized countries throughout the globe.

Caveats filed, assignments duly prepared, examinations made, and a general Patent Agency business conducted.

Established and successfully and popularly conducted for nearly thirty years, our patrons number many thousands, to whom we refer with confidence, as men of influence and reliability. Old and new inventors are cordially offered the complimentary use of our library and free advice, etc. No other ageney can afford Pacific States inventors half the advantages possessed hy this old, well-tried and experienced firm.

DELINQUENT SALE NOTICE.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

NOTICE—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the 26th day of October, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	Shares.	Amount.
W. T. Robinson	7	25,000	$1,250 00

And in accordance with law, and an order from the Board of Directors, made on the 26th day of October, 1894, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California, on THURSDAY, the 27th day of December, 1894, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. STADTFELD, JR., Secretary.

Office, Room 56, No. 309 Montgomery street, San Francisco, California.

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MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alpha Con, Nev	13	10c	Oct 30,	Dec 3,	C E Elliot, 309 Montgomery
Alta S M Co, Nev	48	10c	Nov 28,	Jan 3,	J E Jacobus, 309 Montgomery
Best & Belcher M Co, Nev	57	25c	Nov 12,	Dec 18,	M Jaffe, 309 Montgomery
Bulwer Con M Co, Cal	10	5c	Dec 11,	Jan 16,	Feb 15, J E Jacobus, 309 Montgomery
Challenge Con, Nev	17	5c	Oct 31,	Dec 4,	C L McCoy, Mills Building
Gray Eagle M Co, Cal	38	5c	Nov 12,	Dec 14,	Jan 41, C C Harvey, 309 Montgomery
Hale & Norcross, Nev	106	25c	Nov 23,	Dec 29,	Jan 23, A B Thompson, 309 Montgomery
Justice M Co, Nev	57	5c	Nov 2,	Dec 6,	Dec 27, R E Kelly, 309 Montgomery
Kentuck Con, Nev	72	10c	Nov 14,	Dec 19,	Jan 9, G D Edwards, 414 California
Mexican G & S M Co, Nev	51	25c	Dec 5,	Jan 8,	Jan 29, C E Elliot, 309 Montgomery
Mono G M Co, Cal	34	15c	Nov 19,	Dec 27,	Jan 21, M E Willis, 309 Montgomery
Occidental Con, Nev	17	5c	Nov 1,	Dec 4,	Dec 27, A K Durbrow, 309 Montgomery
Ophir S M Co, Nevada	64	25c	Dec 10,	Jan 14,	Feb 4, R B Holmes, 309 Montgomery
Overman S M Co, Nev	72	10c	Nov 14,	Dec 19,	Jan 9, G D Edwards, 414 California
Potosi M Co, Nevada	43	25c	Dec 11,	Jan 14,	Feb 5, C E Elliot, 309 Montgomery
Quincy M & W Co, Cal	1	20c	Oct 31,	Dec 11,	Jan 4, W C Ralston, Mills Building
Silver Hill, Nev	34	5c	Nov 19,	Dec 26,	Jan 16, D C Bates, 309 Montgomery
Union Con S M Co, Nev	50	20c	Nov 22,	Dec 27,	Jan 16, C C Harvey, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Andes S M Co	J W Twiggs, 309 Montgomery	Dec 18
Gould & Curry M Con	A K Durbrow, 309 Montgomery	Dec 17
Kentuck Con M Co	A Waterman, 309 Montgomery	Dec 19
Wyoming G M Co	W J Gurnett, 308 Pine	Dec 17

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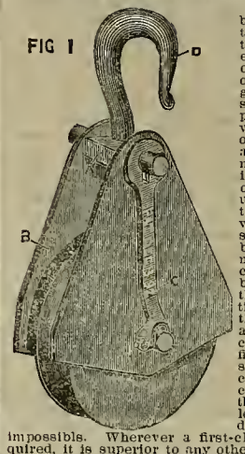

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ANNUAL MEETING.—THE REGULAR ANNUAL meeting of the stockholders of the Gould & Curry Mining Company will be held at the office of the company, room 69, Nevada block, 309 Montgomery street, San Francisco, Cal., on MONDAY, the 14th day of December, 1894, at the hour of 1 P. M., for the purpose of electing a Board of Trustees to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, December 14, at 3 P. M. ALFRED K. DURBROW, Sec.

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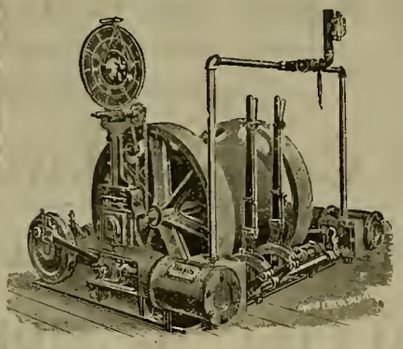

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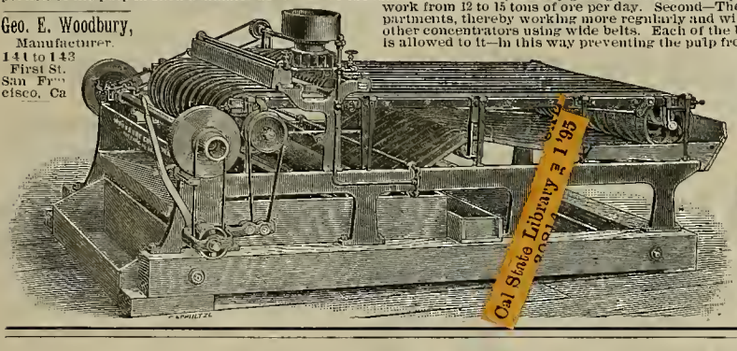

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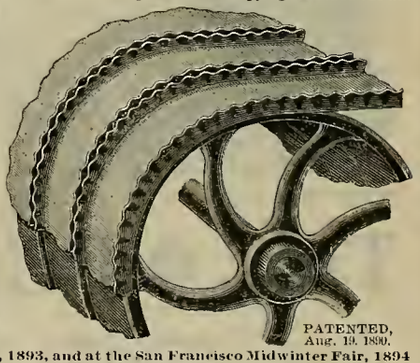

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 25. SAN FRANCISCO, SATURDAY, DECEMBER 22, 1894. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Anaconda Mines and Works.

The largest copper smelting property in the world is at Anaconda, Montana. During the past eleven years the magnitude of the plant and its results have been steadily increasing, till now the employes are numbered by the thousand, and the business aggregates over a million dollars a month. About 4000 tons of ore are daily treated at the smelters, which are in continuous operation. The works constitute a little town in themselves, comprising a large number of different divisions, each subdivided into details corresponding with the requirements of the process of taking the ore from the car and turning it out merchantable copper. The concentrator alone is of vast proportions; the smelter and furnaces cover acres of ground; the eighty tank houses, power houses, store rooms, offices, etc., occupy a large area, and, in connection with this, is the proposed great converting plant, to cost over a million dollars, and intended to be the largest and most complete institution of the kind in the country. The company's thousands of men are also employed in the Anaconda mine, near Butte, and adjacent mines, in their coal mines, fire brick, coke, etc., the payroll exceeding that of any other mine in the United States.

UPPER WORKS OF THE ANACONDA SMELTING CO., ANACONDA, MONTANA.

We are indebted to the *Montana Mining and Market Reporter* for the three cuts which herewith illustrate a portion of Montana's great industry. From 1885 to 1892 inclusive the Anaconda Mining Co. has extracted from the mines in Butte district over 450,000,000 pounds of copper. Everything is on a gigantic scale and constitutes an important factor in the great industrial interests of the State.

THE ANACONDA MINE.

A PORTION OF THE WORKS.

REGARDING the much talked-of trust or combine among the Colorado smelters, one of the members of the Bi-Metallic Smelting Co. of Leadville naively says: "The life of the combine will depend on the miners themselves." Just so: if they stand in, they will narrow their own market and then must do the combine's dictation. Otherwise, otherwise.

T. A. RICKARD says: "A 'veiu' is a fracture in the rocks carrying ore; when such a fracture cuts across the bedding planes of the country it is styled a 'true fissure vein;' when the fissure vein is not inclosed by a single rock formation but has one wall of one kind and the other wall of another kind of rock, then it is a 'contact fissure vein.'"

THE Bunker Hill and Sullivan mines at Wardner are still at a deadlock. Two adverse suits against the company are pending in the United States Court. The Miners' Delight mine in the Yreka district, Shoshone county, Idaho, is involved. J. A. Campbell is the plaintiff in one suit and Jno. Downs in the other. The plaintiffs allege that the Miners' Delight overlaps four of their lap claims, the joint overlap including all of the Miners' Delight. The case will bring out many interesting legal points. The plaintiffs claim prior location in the Downs case, and allege in the Campbell case that the Bunker Hill people failed to comply with the law respecting assessments.

AN exchange has the following sound advice: Whether you fight or work, don't make too much fuss about it. The hen cackles after she has laid her eggs. The noise and sizzle of the locomotive are not force. All force is silent. The hee-haw of the mule may startle you—but it is not nearly so dangerous as his hind legs. Bear in mind that it is the empty wagon that rattles most when in motion. The noise of the drum is due to the fact that there is nothing in it. Bear in mind that you can't startle the world by jumping up and hollering "Boo!" Thought is the great motive power, and don't you fall into the mistake of believing otherwise.

FOR some months negotiations have been in progress for the sale of the Weber group of mines, five miles from Fairview, Idaho, and the milling plant and property in the town, and the deal is now considered practically closed. It involves the reorganization of the company, with ex-Governor Russell Alger of Michigan as president, and W. D. Preston, cashier of the Metropolitan National Bank of Chicago, as secretary, the Weber brothers retaining a considerable block of the capital stock. The consideration is not announced. The Weber group includes five claims, all being worked by a tunnel half a mile long, and considerable machinery, together with a combination gold and silver mill at Fairview. It is said that the new company will build a road from the mine to the mill next summer and make other improvements. The company has water power at its disposal, and is considering the proposition of using electricity to propel the proposed line.

MENTION was made last May of a party of miners, assayers and explorers who, under the leadership of A. R. Hammond, were going to Southern Africa there to seek for tune in that far-off El Dorado. They went, to the number of twenty-five. Now they are returning. A few remain there, and, while it is to be hoped they will do well, for enterprise and courage deserve success in all events, yet, unless a man is of extraordinary ability, has considerable influence, or has the promise of something lucrative, it is doubtful policy to spend so much time and money in that way, especially in leaving a State in which the expenditure of the same amount of coin and energy would insure far more satisfactory result.

BUT a few days remain in which to record non-assessment notices. Owners of mining claims who have not already taken advantage of the chance to save $100 should remember that the time for recording such notice expires the 31st of this month.

ENGLAND has no silver mines, but wants cheap silver. No direct shipments of silver were made to the United States from India during the past fiscal year.

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J. F. HALLORAN.....General Manager

San Francisco, December 22, 1894.

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FOR the twenty-ninth time the MINING AND SCIENTIFIC PRESS wishes its readers a merry Christmas.

STEEL rails are quoted now at $22 a ton, a big comedown from the days when $150 a ton was paid.

FREQUENTLY, says *Printer's Ink*, the most expensive space is the cheapest. It's how many dollars' worth of goods do yon sell in proportion to the cost of your advertisement, and not how much does yonr advertisement cost yon per line.

THE *Montana Mining and Market Reporter*, three months old, and a very creditable looking jonrnal, thinks that a mining paper that stands up for the mining interests of the section it represents should have the preference in the publication of mining notices over any and all publications, daily or weekly, and makes logical argument thereon. It is a question that has been argued a good deal, and never yet satisfactorily settled.

An Extensive Plan.

The last State Legislatnre created a new office—Commissioner of Public Works—and the incumbent, Mr. A. H. Rose, has submitted his first annual report to the Goveruor. A partial outline of the report, so far as it related to hydraulic miniug, was given in these columns last week, as presented to the Executive Committee of the California Miners' Association at its recent meetiug.

Regarding the reclamation of river and swamp land, the commissioner thinks that the lack of a general uniform system is the cause of the failure of present levee systems. Levees should be under Government control, and cross levees should be provided with floodgates, and flood channels through the valleys should be made. He recommends that the Yuba, Bear and American rivers be turned into the American basin, a swampy depression declared to be undrainable. This plan, it is believed by the commissioner, would enable the hydraulic miners to operate along the banks of those rivers. Miniug debris would spread over the swamp and iu course of time make new and valuable land. This, says the commissioner, would put an end to the great question of disposing of hydraulic mining debris.

The report shows that since 1855 the State has paid out $3,191,588.20 in reclamation works; the United States Government, $1,061,750, and the organizers of various drainage districts, $14,783,464, making a total of $19,036,802 expended without anything like commeusnrate results. The commissioner is of the opinion that the cost of the proposed work should be borne by the General Government by direct appropriations from the general treasnry, and the construction to be under the direction and supervision of the California Debris Commission. Recommendation is made for an appropriation of $50,000 to collect data for the extension of the work to the San Joaqnin valley. From Augnst 12, 1893, to December 1, 1894, the expenditnres of the Public Works Commissioner's office were $25,156.82, leaving an unexpended balance of $4843.11. The report inclndes a personal report from Messrs. Manson & Grnnsky, the consulting engineers, who present estimates of what the carrying out of their proposed drainage and protection works would cost, the total being set at $9,287,000. They state that there are 1,090,500 acres of land subject to innndation within the area which would be benefited, the valne of the property being about $100,000,000. Of this acreage all but abont 50,000 acres, they estimate, would be completely reclaimed, and nearly all of that would be available for pastnrage, etc. The proposed plan of reclamation and protection comprises the enlargement and ntilization of the river channels to their maximnm capacity as drainways; the ontflow of snrplus waters from the river channels at selected points, and control of the snrplns water between embankments forming by-pass channels and a rapid delivery of the same into Suisnn bay. Of these escape-ways, they snggest that one should traverse the Colnsa basin, returning to the river at Knight's Landing; and that others should be located in the Yolo basiu, the Bntte basin, etc., their combined effect being to keep the waters of the river always nnder complete control.

Progress of the Work.

At the recent convention of the Cal. State Miners' Association it was determined to take snch action as would check aud permanently prevent the acqnisition by railroad companies in this State of nnpatented miueral lands which lie within the limits of land grant and indemnity land grant limits. The subject was thoroughly discnssed, and President Neff appointed a committee "for the protection of mineral lands from railroad grants," whose dnty it was to be to "appear before the Department of the Interior by memorial and by agent, to endeavor to stop the patenting of mineral lands to the snbsidized railroads; also, to obtain an order from the Commissioner of the Geueral Land Office that the bnrden of proof that land claimed as agricnltnral by the railroads shall be placed on those corporations, in accordance with the decisiou of Justice Field in the Barden case" in Montana.

The committee is moving in the matter and, as a preliminary, is having prepared maps of the lands lying within railroad grants in this State. Under date of the 13th inst., the gentleman to whom has since been delegated the work of preparing such map writes as follows:

A. H. Ricketts, Esq., Chairman of the Committee for the Protection of the Mineral Lands, San Francisco—DEAR SIR: In compliance with your instructions given to me yesterday, I have made examination into the obtaining of data for the presentation, in concise form, of the lands lying within the railroad grants within this State, and beg to report to you as follows thereon:

That, in my opinion, the most convenient method would he to prepare maps, which would show tbe boundaries of the townships and sections, the principal streams, topographical features; also, in distinctive colors, the boundaries of the various railroad grants, the presumed boundaries of the most important mineral lands.

I propose to make this map on a scale of one and one-half inches to a township and one-quarter of an inch to a section. It would require two maps, one of which would include the territory from about Santa Cruz on the south to the Oregon boundary on the north and from the Nevada boundary on the east to sufficiently far west to include the Oregon railroad grant. This map would he about five feet hy three and one-half. The other map would include the southern portion of the State from a little north of Los Angeles, perhaps to the Mexican boundary, and from the ocean to the Colorado river. This last map would he about three feet hy four. The maps could he hlack printed and any given numher of maps could he made from each at a nominal cost.

I estimate that it would require for the completion of the maps at least two weeks, without marking thereon the railroad selections, which would take a week or ten days more time. These maps will show graphically and at a glance the status of the matter.

As soon as these maps are ready (which will be abont Jan. 1st) the committee will have something tangible on which to prepare its case. Meanwhile an effort is making to have the President or the Secretary of the Interior issue an order suspending the issuance of any and all patents of the natnre protested against till the committee has opportunity to show specific canse why such action is at variance with the better and broader interpretation of public requirements.

When Congressman Caminetti addressed the convention he said: "Along the liue of the Pacific railroad grant to-day patents are being issued to the railroad for lands that are actually mineral and ought to be given to the miner. Unless you stop that work yon will lose the opportunity of getting the valuable mines that are now npou this land."

The total amonnt of the S. P. land grant in California is 1,638,000 acres. To Jnne 30, '94, 491,000 acres had been patented, and on that date there were pending selections already approved by the officers and only awaiting final decision of the Secretary of the Interior and the President's signature patents to 414,500 acres, the remainder not yet located and snrveyed aggregating 732,000 acres. On the 19th inst., the Secretary of the Interior approved clear lists of lands as the basis for land patents to the Northern Pacific Railroad, embracing 91,414 acres within the Cœnr d'Alene and Lewiston land districts of Idaho; to the Southern Pacific, embracing 19,190 acres near Los Angeles; to the Southern Pacific, embracing 47,506 acres within the primary limits of the company's grant in California, and to the Central Pacific, covering 33,759 acres in the neighborhood of Salt Lake City.

To stop snch issnance of patents to the railroad company for the remainder of those 414,500 acres till the miners' side of the case can be heard is the present effort of the committee.

What is known as "the Idaho-Montana bill" has passed the Honse and is now before the Senate. A similar bill has been introdnced in the Honse by Congressman Caminetti, anthorizing the Secretary of the Interior to canse all nnpatented lands in this State within the land grant and indemnity land limits of the Central Pacific Railroad Company to be examined and classified by six Commissioners appointed from the Sacramento and Marysville districts by the President of the United States, with reference to the mineral or non-mineral character of the lands, the Commissioners to have power to cancel any and all claims heretofore, and which may be made hereafter, on behalf of the Ceutral Pacific Railroad on any nnpatented lands in the State, which npon examination shall be classified as mineral lands. The bill provides that all nnpatented lands in this grant shall be taken to be mineral lands which, prior to the passage of this Act, have been located or patented as mineral lands, or which have, or will have, a market value by reason of the minerals which they contain, or which show snch indications of deposits of valnable minerals as would indnce a miner to spend his time and money upon them, or which, from their geological formation or location in a well-defined mineral belt, will probably be valnable for minerals. On snrveyed lands the classification is to be by sections, and on nnsnrveyed lands by tracts, with snch artificial or natural boundaries as the Commissioners may determine.

Where locations have heretofore been made, or patents issued for mineral ground in any section of land, this shall be taken as prima facie evidence that the forty-acre snbdivisiou within which it is located is mineral land, bnt the word mineral in this bill does not inclnde coal or iron. A report of lands classified by the Commissioners is required to be furnished to the Registrar of the Land Office in the district in which they are situated, and this report mnst be published in some county paper for four consecntive weeks. Parties aggrieved by the classification of the Commissioners may appeal to the Land Office officers aud to the Commissioner of the Land Office, as in case of land contests.

One trouble with the bill seems to be that its provisions apply only to the Sacramento and Marysville land districts and the C. P. land grant. There are other districts wholly unmentioned, and other California railroad corporations beside the C. P. That bill needs amending. Its scope appears to be too limited to render the desired relief.

The Association, through its committee, is going abont the matter promptly and in the right way, and deserves the hearty and substantial support of those for whose rights it is working and who are most vitally interested in the results.

Concentrates.

THERE are about sixty men working at the Thistle shaft, Plumas county.

THE Poorman-Consolidated is to be Anglicized, and the directors hope for better things.

ON the Le Roi, Trail creek, B. C., a body of ore forty feet square was found at the surface.

THE James mill in Pioneer district, Amador Co., recently destroyed by fire, is to be rebuilt.

THE Homestake Mining Company's latest $25,000 dividend makes a total to date of $5,312,500.

THE mines around Jackson, Amador Co., are now paying out about $40,000 a month for labor alone.

THE Blue Jay mine, Butte, Montana, has been sold to the Butte and Boston Company for $75,000.

THE Gilt Edge mine and mill in Fergus county, Montana, has started up with a force of thirty men.

THE Nevada State Exhibit at the Midwinter Fair cost $13,985.24, of which $11,748.50 was subscribed.

J. B. HAGGIN has sold the Aurora Borealis mine near Virginia City, Montana, to J. McParlane for $10,000.

THE October and November cleanups at the Alaska-Treadwell show that 52,754 tons of ore yielded $89,073.

THE mill to be built at the Oro Fino mine will be 2000 feet from the mine on Deer creek. It will have forty stamps.

THE Montana Mineral Land Development Company is about to build a concentrator on the Eva May mine near Basin.

THE snow slide at the English Mountain mine near Graniteville will cause the suspension of work there for the winter.

THE La Cananea copper mine in Sonora, Mexico, has been sold by the widow of Gen. Pesqueira to Americans for $90,000.

BARON SWANSEA, owner of the vast smelting works at Swansea, Wales, who was in this country this summer, is dead.

THE superintendents, miners and business men of Virginia City have contributed $2101 for the orphans of St. Mary's school.

WORK at the Golden Feather channel mine, near Oroville, has closed for the winter with promise of good results next spring.

THE Ajax Mining Company of Tintic, Utah, has decided to build a concentrating plant with which to work their second-class rock.

T. F. HYNES of Philipsburg, Montana, has foreclosed a mortgage for $54,225 against the Puritan Mining Company of Granite county.

THE Great Falls Reduction Works are treating a large quantity of ore mined on Trail and Twelve-Mile creeks and around Kaslo, B. C.

IN Nova Scotia, for the nine months ending September 30th, 47,330 tons of gold ore were crushed, yielding an average of seven dwt. to the ton.

IT is probable the gold output in the Witwatersrand mines for '94 will aggregate 2,000,000 ounces. For the first ten months it was 1,668,761 ounces.

A CARLOAD of ore from the Gray Eagle mine, Squaw creek, Washington, was shipped to the Everett smelter, and the returns were $187 in gold to the ton.

THE copper mines of Butte are all in full blast and the smelters, both there and in Anaconda, are taxed to their full capacity to keep pace with the mines.

THE twenty-stamp mill at the Springfield mine, in El Dorado county, has been sold to the owners of the Richmond mine, near Plymouth, and taken there.

THE Daisy Hill mine, near Grass Valley, has a fine plant and a ledge of free-milling gold ore that encourages the owners in the just belief that they have a bonanza.

A CONTRACT for sinking the main shaft at the Virtue mine, near Baker City, Or., 100 feet deeper has been let to a company of nine Cornish miners, at $20 per foot.

MRS. E. C. LOFTUS of Sonora, Tuolumne Co., aids in the superintendency of the Golden Gate mine, which is reported to yield a yearly profit of $168,000, and does it well.

AT the annual meeting of the Andes held last Tuesday the old officers and board of directors were re-elected. The financial report showed a balance of $9300 in cash on hand.

THE Crevasse Mountain Mining Company has suspended operations at their mill in Crevasse, Park county, Montana, for the winter on account of insufficient water supply.

THE Nevada City *Herald* says the Champion mine intends to run to its full capacity. In a short time there will be as many men employed there as there were before the shut-down.

THE Salt Lake City Copper Works will shortly be in a position to fulfill the promises which it has been making for two years and push the great copper plant to a speedy completion.

AT a depth of 300 feet on the Paymaster, on the American side of the Okanogan, the pay streak averages sixteen inches in width and runs from $60 to $1000 to the ton. Considerable free gold is found.

THE Cumberland carbonate mine at Castle, Montana, has been sold at receiver's sale to J. K. Tod of New York, one of the former owners. The property is equipped with an expensive hoisting plant.

THE Duck Creek Mining Co. has incorporated at Spokane, Wash.; capital stock, $1,000,000. Incorporators—J. F. Sloane, P. Richmond, G. M. Forster of Spokane, C. M. Reese, J. H. Field of Minneapolis.

THE Big Canyon Mining Company, near Placerville, Cal., are preparing to increase the size of their mill to a capacity of thirty stamps by adding ten new ones. About forty men are employed at the mine at present.

THE Bellingham Bay Hydraulic Mining Co. has incorporated at Fairhaven, Wash.; capital stock, $30,000, with shares at $50 each. Incorporators—L. W. Nestelle, F. J. Hamilton, H. A. Compton, C. C. Taylor, W. Hedge.

DURING the month of November there were 163 quartz lode location notices filed for record with the recorder of Jefferson county, Montana, and eighteen placer location notices. There were also 126 non-forfeiture notices filed.

STIPULATIONS dismissing the appeal in the case of the Champion Mining Company, appellant, vs. the Consolidated Wyoming Gold Mining Company, appellee, were filed in the United States Circuit Court of Appeals last Wednesday.

THE Butte, Montana, *Inter-Mountain* says the concentrates from the Kutie mine at Basin continue to surprise the mining men of that section. They average $2800 in gold to the ton, and frequently show up nuggets of free gold as large as a pea.

AT the Seth Cook mines, near Coulterville, Mariposa Co., in which section capital from everywhere in the Union, except San Francisco, is being invested, two three-compartment shafts are being sunk. A twenty-stamp mill is next is order.

THE Denver *Record* declares that W. S. Stratton is preparing to hoist a million dollars' worth of rock from his Independence mine in a single day. He thinks the rich sylvanite ore recently encountered in the lower level will enable him to do it easily.

The Bridgeport Mining and Milling Company of Okanogan county, Wash., have a fifty-horse power steel locomotive boiler, a forty-horse power or five-drill capacity air compressor, a double hoisting engine and twenty-horse power boiler, and other new machinery.

THE Mohave *Miner* says the bars of the Colorado river are to be worked for the gold in their shining sands, but gives no particulars of the project. An hydraulic process of working the bed of the Colorado river would contribute considerable gold annually to the world's supply.

FOR the week ending Nov. 15th, at the Broken Hill Proprietary silver mine, Australia, 10,382 tons of ore were treated, yielding 910 tons of lead, containing 242,896 ounces of silver, also 1111 tons treated by amalgamating and leaching plants, producing 16,142 ounces of silver.

THE Godfrey Gold and Silver Mining Company has filed articles of incorporation in this city. Capital stock, $2,400,000. Organized to do a general mining business in Tuolumne county. The stockholders are E. L. Lowe, T. G. Maguire, E. Maguire, S. Lowe and L. W. McGlanflin.

DR. HENRY WURTZ figures nine-tenths of a grain of gold in each ton of sea water, and thus computes that the entire ocean contains over $80,000,000,000,000,000 of gold. One of the problems of the future, Dr. Wurtz predicts, will be the getting of some of this gold by electrolysis.

DURING eleven months of the present year Wells, Fargo & Co. transported from Kingman, Arizona, in gold bullion $11,660, and $47,650 in silver bullion. The A. & P. transported 350 cars of gold and silver ore to Eastern smelters, the aggregate value being in the neighborhood of $1,008,000.

THE annual report of the Oro Preto Co. (Brazil) shows the value of the gold produced during the term covered by the report to be $22,500—more than the aggregate of the preceding year. Of this $5000 was due to the better quality of the ore and $17,500 to the improved method of treatment.

AT the Yellow Jacket mine, 75 miles north of Challis, Idaho, a 40-stamp mill is building. The ore is free milling and averages $12 to the ton. The Columbia Hill Co. is also doing considerable preparatory work. It is thought that the 300 men now there will be increased to nearly 1000 next spring.

THE Sutro Tunnel Co. has settled some of its litigation. Pierson & Mitchell sued for $9000 for legal services; they settled for $6000. E. Tausky, another lawyer, wanted $22,000, but took $17,000. The royalties earned from the mining companies will be used to liquidate the claims as now arranged.

THE Crocker-Woolworth Bank last week received a lot of gold bullion from the Hidden Hill mine, near the Needles, San Bernardino county. The gold is very pure and was taken from a point less than twenty feet below the surface. The richness of the find has created a sensation in the region of the Needles.

AMONG mining dividends of the month are the Con. Cal. and Va. of $54,000 last Thursday; the Tamarack Copper Co., $4 per share, payable on the 31st; the Rico-Aspen Co. of Colorado, $25,000, on the 10th; the Standard Con., ten cents per share, on the 20th, and the Homestake, twenty cents per share, payable on the 26th.

LAST week a slide occurred above the big tunnel at the Gold Bank mine at Forbestown, Cal., which covered the mouth of the tunnel to a depth of about thirty feet, demolished the blacksmith shop, destroyed machinery, cars, etc., causing a damage of about $1000. The distance of the slide was about 300 yards.

OF the numerous mining companies operating in the Black Hills, but few give publicity to their product or profits. There are seven companies in Lawrence county, nearly all located in Whitewood quartz mining district, that have distributed among their stockholders $7,909,000 in dividends, and they keep on adding to the amount every month.

MRS. HETTIE GREEN, the richest woman in the United States, is the principal owner in the Amador Consolidated mine on Sutter creek. Millions of dollars were taken from that "old Hayward mine" as it was called, and it is believed to be a very rich mine yet. It has been idle for seventeen years, and the 2200-foot shaft is full of water.

W. G. RIFENAURO, an old-time smelting man and miner, would put in a thirty-ton smelter at the Needles if he could get the lease of the reduction works. He has a smelting plant now idle at San Diego, which he had removed from Ensenada, Lower California, being forced out of business by the excessive taxes and duties imposed by the Mexican government.

A CERTIFICATE OF INCORPORATION of the New Southern Cross Company has been filed in Butte, Montana, by Sophronius Marchesseau, Octavius Hight and Cornelius P. Drennan to carry on mining and milling business; capital stock 412,000 shares of assessable stock at a par value of $3 per share, operations to be carried on in Deer Lodge and Silver Bow counties.

THE celebrated Last Chance mining case has been set for final determination in the Supreme Court of the United States on the first Monday in March. The suit which has been running for years in the lower courts involves the title to mining interests in the Cœur d'Alene district worth $500,000. The Last Chance men recently had the verdict in the lower court set aside.

COULTERVILLE, Mariposa county, is reported to be lively. Lots in the town that two months ago were valued at $200 and $300, with no purchasers, are now being sold for $1000 and upwards. Men awaiting the opening of the mines are camped in tents along the gulches and ravines in large numbers. Rents are high and all buildings are occupied.

ONE or two Montana papers, in estimating the United States gold production for '94, give Colorado first place and Montana second place in the list of gold producing States. As a matter of fact California leads in '94 as in other years. In '93 the gold yield was about $12,500,000. This year it will approximate $15,000,000, over one-third of the entire product of the country.

AT last Monday's meeting of the Cal. Debris Commission the applications of John Black of the Spanish mine and E. P. Hager and Samuel Peck of the Blue Tent mine, Nevada county, for permission to commence hydraulic operations were granted, satisfactory dams having been built. The applications of G. H. Pease and J. B. Colwell of Placer county were taken under advisement.

AN extensive program is mapped out for itself by the International Metal Co., which has organized at Albany, N. Y., with $1,000,000 capital stock, "to mine all metals except gold and silver in Colorado, New York, Idaho, Montana, Nevada, California, South Dakota, New Mexico, Arizona and Utah, in the United States; Coahuila, Chihuahua and other States of the Republic of Mexico."

AFTER paying all expenses for the past fiscal month the Con. Cal. & Virginia Mining Company had in its treasury a net surplus of $214,959.08. After the monthly dividend of 25 cents per share, amounting to $54,000, was paid last Monday, there remained $160,959.08, or a sum nearly equal to three more dividends of the same amount. The Morgan mill has resumed crushing ore from the mine.

CONSIDERABLE interest, says the *Tribune*, is being taken in the professions of the Bradford process of treating ore. Tests are now being made by its promoters of carload lots of ore from half a dozen of the large mines, both gold and silver. If the results which the test of the Mercur ore yielded can be shown to be obtainable on all grades of ore, a revolution in mining in Utah may well be deemed imminent.

THE War Eagle Mining Co., incorporated at Spokane, Wash., with $500,000 capital, proposes to buy, lease, bond, hold and operate mineral properties in the United States and British Columbia; to construct, maintain and operate concentrators, mills, reduction works and smelters. The trustees are P. Clark, A. Corbin, W. J. C. Wakefield, A. T. Herrick and B. C. Kingsbury, Spokane; and J. A. Finch and A. B. Campbell, Wallace, Idaho.

THE Golden Jack Milling, Mining and Development Company has incorporated at Trinidad, Col., for operations at La Belle; capital stock, $300,000. The officers are John Mayer, president; N. F. Gagnon, secretary; C. E. McCarthy, treasurer. The managers of the company expect to have one or more producing mines in operation by spring. Assays received from two lots of fifty pounds each, taken from the Little Mollie, give returns of $43.20 per ton.

THE *Leader* says the laborers of the Gladie mine at Sierra City compelled one of the managers, who went up from this city, to sign a note for the total amount of their wages, amounting to $1500, last Monday, before they would permit him to leave for Downieville. This was an illegal procedure and the note is invalid, because it was signed by compulsion. The company is an incorporation and their indebtedness is good, in case the mine is attached.

THE St. Joe and Mineral Farm Consolidated Mining Company and the Pontiac and Champion Empire companies of Aspen, Col., propose to consolidate into a new company, capitalized for $3,000,000 in one dollar shares, one million shares to be treasury stock. Of the remaining two million the St. Joe and Mineral Farm is to receive half, the Pontiac 33⅓ per cent and the Champion Empire 16⅔ per cent. It is intended to put the treasury stock up at 25 cents or more, to raise money for development.

IT is figured that the Pilot Bay smelter will employ 109 men at an aggregate daily wage of $307.50, and will daily require 20 tons lime rock, 40 tons iron ore, 30 tons charcoal and 12 cords wood, worth $590, making a total of $897.50 per day paid out; and that the works will be in operation about December 15th. Ore is being taken out in many of the smaller mines and will be shipped forward as soon as the smelter starts up. D. W. McVicar of Nova Scotia has leased the Number One, near Ainsworth, and taken an option on the concentrator.

AN agreement is reported concluded between the Anaconda and Calumet and Hecla companies, under the terms of which the former company undertakes to reduce their production to the level of the latter company—say to about 5,500,000 lbs. per month. As in the month of October the Anaconda company produced 9,300,000 lbs., this reduction represents about 1500 tons per month. The production of the other three leading Montana companies in October was 6,100,000 lbs., and that of the other leading Lake Superior company—the Tamarack—900,000 lbs., these figures about representing the extent of their present capacity. It is believed that the Rio Tinto company have agreed not to increase their production. Copper shipments to Europe continue on a reduced scale, being about 4000 tons for November, making the total for eleven months of this year about 69,552 tons against 70,903 tons in the same period last year. As 22,000 tons less have been shipped in the five months from July to November this year than last, it is evident that the private stocks of American copper held on the continent must now be less than at this date in 1893, the public stocks in England and France showing an increase of 6068 tons. Consumption both in this country and in Europe must have been much larger this year than last, and seems likely to improve.

Personal.

C. W. MERRILL, formerly of Bodie, is putting up a cyanide plant at Harqua Hala, Arizona.

J. B. STETSON has been chosen president of the Edison Light and Power Company, to succeed the late Geo. Roe.

LIEUT. C. E. GILLETTE, of the Debris Commission, has returned from a visit of inspection from San Francisco at Rough and Ready.

ROBERT STIGHT has resigned as metallurgist at the Golden Sunlight mines at Whitehall, Montana, to accept a like position on an Australian mining property.

Utah Variscite Mines.

To the Editor:—Some time ago I visited the variscite mines discovered November, 1893, near old Camp Floyd, Utah Co., Utah. This is the first of this mineral discovered in this form in the United States and, as to quality, is the finest in the world. It occurs reniform, and the country rock in which it is found is metamorphic limestone, through which run ribbons of hard black quartz. The gems vary in size from a small plum to an occasional one as large as an ostrich egg. The matrix in which the gems lie is an oxidized iron silt, although we sometimes find them imbedded in the narrow quartz veins and adjoining limestone. The nodules upon being removed from the matrix are very unpretending looking objects, resembling half-decayed Osage apples; but upon removing the clayey coating we find a yellow coating, being luminar and of an agatized nature. This around an average-sized nodule is from an eighth to a sixteenth of an inch in thickness. Under this last coating we find the variscite, like the kernel in a nut. Its color varies from light to dark green; we find shades of sea green, pea green, emerald, and some as dark as olive. As a gem it is susceptible of high polish and possesses rare and striking beauty either for jewelry or for the cabinet of the collector. Unfortunately it does not occur in great quantity; for this reasou it can never be possessed save by the few fortunate collectors. Its very existence adds to the wealth of American minerals.

In mining for the nodules of variscite, the greatest care must be taken lest an unlucky stroke of the pick may strike and destroy a valuable jewel, and although the little silt veins in which they rest are narrow and few, and the rock enclosing them being of an unyielding and refractory nature, very little blasting can be done owing to the danger of shattering the nodules contained in the vein matter. In this way it will be seen that the work of securing the sparsely scattered jewels is slow and difficult, but he who, even with great labor, secures one of a few ounces, possesses a valuable and rare accession to his cabinet.

The discovery of this mineral has been made note of by different American and foreign journals devoted to science and mining, but no descriptive report has been given to the general public, as might be expected upon the discovery of a rare or beautiful "find."

The locality containing it is a spur of the Oquirr range of mountains in central Utah; the spur is a low, short tongue extending out from the east base of the range, near a pass that leads into Rush valley from Cedar valley. It lies on the entrance to the great American desert and is only about three and one-half miles northwest of old Camp Floyd, where the army of Utah, commanded by Albert Sidney Johnson, was encamped by the side of the Big Springs from the year 1857 to 1861.

Six miles to the northward there are gold mines, among which is the famous Mercur mine, the output of which is treated by the cyauide process. At the variscite mine the scene is wild and desolate. A few stunted cedars grow arouud on the hills. To the hill on which the mine of variscite lies, the name of Chapultepec has recently been given. This was prompted by the idea conceived by many that this lovely green stone was in some way connected with the jewels of the Aztec emperors of Mexico, whose magnificent green gems of Chalchihuitl became the admiration of the courts of Europe, aud very few of which are known to exist. I found, to my regret, that there were no signs of ancient excavatiou upon the ground. If such work was done, it was carefully covered over by the ancient workers. Near by I discovered two mealing stones, such as were used by the extiuct races of southern Utah and Arizona, and the same as are now used by the lower classes in Mexico and known by the name of metate. Three miles to the southward, near the pass, I found very interesting picture writings, etched there doubtless in the vauished ages by the lost race whose remains are so abundant in the deserts of the Southwest, and perhaps we may yet find proof that the variscite mines of this region were known and worked by those same people and that the famous jewels now lying in the ethnographic museums at Rome (Italy) and Berlin were once taken from this wild and weird spot, where the genii of wealth stored their treasures at creation's dawn.

A short report was made upon this Utah variscite in the early part of the present year by Prof. Henry Montgomery, then of the Utah University; also by Dr. James E. Talmage and by Prof. Merrill of Washington, D. C. Its analysis is little different from that of turquoise, save that where copper is the coloring agent in turquoise, that in variscite is found to be manganese and iron. The structure is largely hydrous aluminum phosphate, which, upon being exposed to intense heat, changes from green to a beautiful pink or sometimes purple. Don Maguire.

Ogden, Utah, Dec. 5, 1894. 549 Twenty-fifth St.

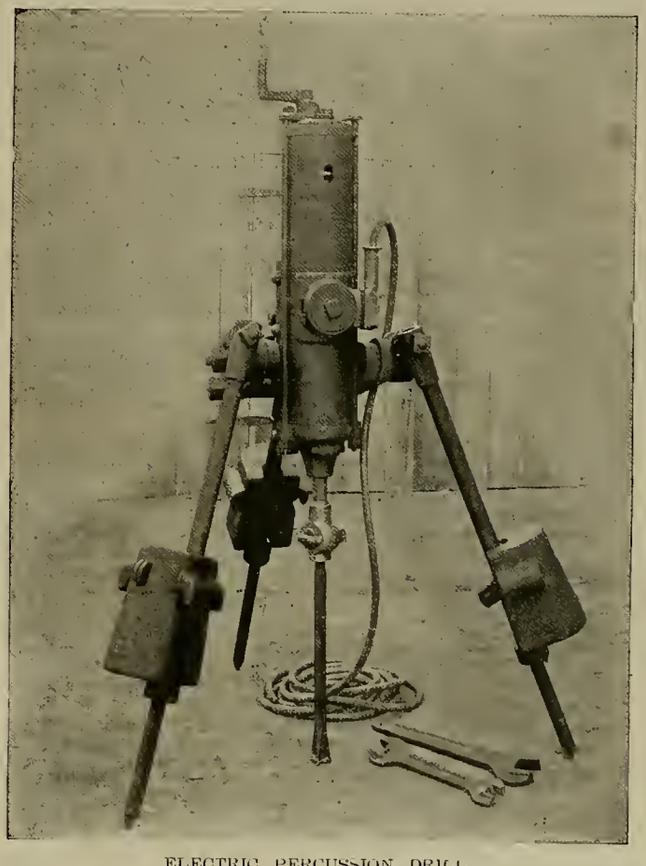
Thirty feet is the usual length of steel rails. But the Lehigh Valley has decided to adopt forty-five hereafter, except in tunnels, where ninety will be the standard.

Electric Percussion Drills.

The accompanying illustration shows a type of electric percussion rock drill made by the General Electric Co.

In general external appearance the electric drill conforms very closely to the regular types of steam and air drills—in fact, the tripod and shell complete are of the standard steam drill form.

The drill body includes two energizing coils, with



ELECTRIC PERCUSSION DRILL.

mica insulation. Within the magnetic fields of these coils is a reciprocating pistou which is forged in one solid piece with piston rod and drill chuck. The piston is provided with the standard air drill rotating rifle-bar and the usual form of sprinugs to protect the front head of the drill from blows. The drill consumes about seven and one-half horse power at 220 volts, and is operated on a three-wire circuit from the generator.

The total horse power of the engines of the world, not including locomotives, of which there are 105,000 with a total horse power of 3,000,000, is 46,000,000, which represents all the force that could be exerted by 1,000,000,000 men, or more thau twice the total working population of the entire globe.

Free Entry.

The following articles have free entry into the United States: Photographs, maps, charts (printed more than twenty years at the date of importatiou), hydrographic charts, scientific books and periodicals devoted to original scientific research, and publications issued for their subscribers by scientific and literary associations or academies, rough Brazilian pebble, emery ore, glass plates or discs, rough-cut or unwrought, for use in the manufacture of optical instruments, spectacles and eyeglasses, and suitable only for such use: *Provided*, however, that such discs exceeding eight inches in diameter may be polished sufficiently to enable the character of the glass to be determined, ivory and vegetable ivory in the rough, magnets, philosophical and scieutific apparatus, utensils, instruments and preparations, including bottles and boxes containing the same; and paintings, drawings and etchings, specially imported in good faith for the use of any society or institution incorporated or established for philosophical, educational, scientific, or literary purposes.

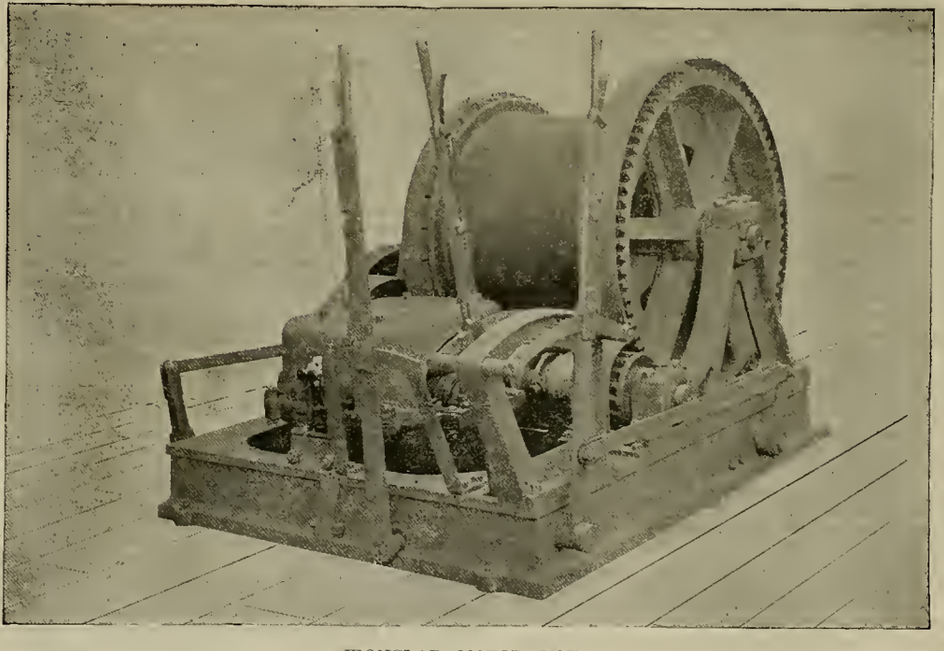
A test has recently been made of a new locomotive constructed to use erude petroleum as a fuel. The report says that the engine steamed very rapidly, and emitted little or no smoke. The locomotive was built at the Baldwin Works, in Philadelphia, under the direction of Superintendent Vauclain, who has had charge of the construction of the many "flyers" that have been turned out there. The test run was made between Baltimore and Philadelphia.

Ironclad Motor Hoists.

Herewith is illustrated an ironclad motor hoist, made by the General Electric Co., operated by motors of railway type, in which all moving parts are protected.

The motor is mounted on the same bed-plate as the hoist, to which all bearings, levers, quadrants and other conuections are attached.

The drum is provided with a band brake, lined with wood, and operated by a lever and quadrant. It is thrown in and out of gear by meaus of a friction clutch of the most positive and reliable type, which is operated by means of one of the levers and quadrants shown. The motor is controlled by a rheostat, to which one of the levers shown is attached.



IRONCLAD MOTOR HOIST.

It is said that Thomas A. Edison has already expended nearly $1,000,000 in his experiments to find a commercial method of reducing low-grade ores by electricity.

Uncle Sam's Big Magnet.

The most powerful magnet in the world, excepting those of Nature's own construction at the imaginary points of the earth known as the magnetic poles, says the Philadelphia *Inquirer*, is the invention of Colonel W. R. King, commander of the engineer corps of the army stationed at Willett's Point, L. I., and some very interesting experiments have been made with it. When Col. King conceived the idea of building an immense electro-magnet, he had no thought of its possibilities. There entered into the construction of the first magnet two huge guns, some pieces of iron, and a good many miles of heavy insulated telegraph wire. The guns stood on carriages on top of the fort. The pieces of iron were fastened across the breeches of the cannon, and were held in place by chains, forming a horseshoe. The telegraph wire was wound around the muzzle ends of the guns, making two immense spools. The current of electricity was supplied by a dynamo, and the first time the magnet was charged it developed marvelous power.

The work undertaken simply as an experiment soon became a matter of great importance. The magnet had not been long in existence when it was discovered that it would derange a vessel's compass at a distance of six miles from the fort. This discovery suggested that, if in time of war an enemy's ships attempted to pass the fort under cover of darkness or during the prevalence of a heavy fog, when the pilots would have to depend solely upon the ship's compass, the commanders of the war ships would probably find their vessels ashore near Willett's Point, where they could be blown up with torpedoes or destroyed by the guns of the fort.

Many experiments have been made from time to time in testing the power of the big magnet. One of the most interesting ever attempted was made under the personal supervision of Col. King. A number of pieces of railroad iron were placed near the muzzles of the guns and the current of electricity turned on. Immediately the rails flew to the magnet, and were held as fast as if they had been welded to its immense core. Col. King then had one end of a large chain fastened around the pieces of iron to ascertain the amount of power necessary to pull them away from the magnet. The other end of the chain was attached to a capstan that was held firmly in place by long stakes driven into the ground.

When everything was in readiness for the test the capstan bars were manned by eight stalwart engineers, and they endeavored to pull the railroad iron away from the magnetized guns. After straining for some time, the stakes holding the capstan in place gave way and it toppled over. The railroad iron had not even moved on the face of the magnet. The dynamometer, which had been attached to indicate the amount of strain the magnet would stand, showed that it had resisted 22,500 pounds. It was found impossible to disturb the pieces of railroad iron until the electricity had been shut off

Some time ago Col. King caused to be made the one-gun magnet. Thirteen miles of half-inch insulated telegraph cable was used in making the coil on the gun. Tests with this magnet showed that it possessed almost as much power as the first one, where two guns were used for the core. A number of exhibitions of the working of this electro-magnet was given before members of the American Society for the Advancement of Science. One of the exhibitions attracted a great deal of attention, as it best illustrated the power the magnet possessed.

The test consisted of four cannon balls being suspended from the muzzle of the gun. The balls weighed, on an average, 430 pounds each. The first one was placed under the muzzle of the gun, and, notwithstanding the smallness of the point of contact—made so by the shape of the suspended object—the ball was held very firmly. A second cannon ball was placed under the first one; then a third was put under the second, and when a fourth ball was held up by the magnetic attraction, exclamations of surprise came from the spectators. The smallness of the central point of bearing of each cannon ball, and the rigid manner in which the four iron spheres were held up, was considered to be the best exhibition of the magnet's power.

During a recent series of experiments, an iron tray, heaped up with old horseshoes, big iron spikes, nuts, bolts and other articles made of iron, was given to a soldier, and he was directed to hold the tray in front of him and walk toward the magnet. When the soldier arrived at a point about fifteen feet from the gun the contents of the tray departed with a rush and lodged on and about the muzzle of the big gun. The soldier had all he could do to keep the tray from following the scrap iron.

This test has suggested the possibilities of big electro-magnets being used to defend forts and earthworks from land attacks. A row of them of sufficient power would draw the smaller arms out of the hands of the infantry while the advancing column was still some distance from the place of attack, leaving the soldiers at the mercy of the garrison of the fort.

Combination Heater and Cook Stove.

Edward Miller & Co., New York, show a combination heater and cook stove—heater designed for oil, having a font with a capacity of four quarts, to burn twelve hours. The extreme height as a heater, with the drum, shown in Fig. 1 in position, is 30¼ inches and spread of feet 11¼ inches. The holder and drum are of Russia iron, with nickeled lamp and trimmings. For cooking, the drum is removed and the cast-iron extension top with three holes can be quickly placed in position. For roasting and baking, Nos. 2 and 3 ovens are furnished. The point is made that all the weight of the cylinders and utensils rests solidly on the font and not on the burner. Each lamp is supplied with an extra flame spreader for illuminating purposes when not used as a heater.

FIG. 1.—MILLER OIL HEATER AND COOKER.

FIG. 2.—SHEET IRON DRUM FOR HEATER.

ONE of the latest ways of obviating the trouble in soldering aluminum is to copper-plate the object first. Then ordinary solder will stick as it would to tin.

Increased Business.

The activity in mines means, of course, activity in the manufacture of mining machinery. Considerable has been reported in these columns of the manufacture and installment of several San Francisco made electrical plants. In this as in other lines of manufacture is to be noted the importance of San Francisco as an industrial center. Among larger operations is noted the building by the Fulton Engineering and Shipbuilding Works of a compressor plant for operating the new battery of pneumatic guns which are now being put in place for the United States Government at Fort Point, consisting of four boilers, two duplex compressors of six cylinders each, final pressure of air 2000 lbs. to the square inch. An electric light plant with all its accessories is a part of the contract.

The Fulton Engineering and Shipbuilding Works has a contract for four steam vessels and is engaged in extensive repairs on four Government vessels. They are also furnishing a thirty-ton concentrating plant to the Norman Mill and Mining Co., in the Ripsey mining district, ten miles from Riverside, Pinal Co., Arizona; a five-stamp mill to a mine at Yuma, Arizona; a ten-stamp mill to the Bay State mine, Plymouth, Amador Co., Cal.; a five-stamp mill to the Empire Mill and Mining Co., Copperopolis, and a 100 H. P. Corliss engine and vertical compressor to Wm. Johns, at the Whitlock mine, Mariposa Co., Cal. A duplex compressor has been sent to Supt. Oliver, at the Lockwood mine, Calaveras Co., and a single compressor to the Blazing Star mine, at West Point, besides considerable other mining machinery.

The Union Iron Works, which has been patiently awaiting Government delay on the Olympia, is at last in receipt of the armament which will allow the contractors to get that great war ship ready for service and enable them to again demonstrate that the largest and best work of that kind can be done in San Francisco. There are ten five-inch guns and four eight-inch guns, sent overland in charge of Lieut. Nicholson of the Washington navy yard. It is thought now that a month will complete the vessel. This great protected cruiser has twin screws, triple expansion engines and a ram; two broadside torpedo tubes on each side, a torpedo tube in the stem and another in the stern. The vessel's displacement is 5500 tons. The specifications required a speed of twenty knots an hour, but just a year ago in the Santa Barbara channel she speeded 21.67 knots an hour, for four hours. As there was a premium of $50,000 for every one-quarter knot over Government specifications, she earned her builders a bonus of $300,000, which has been paid. The specifications called for 13,500 H. P., but she developed 17,700 H. P. The Government gets a splendid vessel.

The Union Iron Works is also turning out some fine mining machinery. A twenty-stamp mill for the Baradove Mining Co. of Guanaxara, Mexico, a thirty-stamp mill for the Grand G. M. Co., at Idaho City, and a twenty-stamp mill for the Eagle Mountain Mining Co., Nevada county, are among recent shipments. Additional orders have been received from the company's City of Mexico agency.

The Risdon Iron and Locomotive Works have one of the largest contracts ever let in the State for ten Galloway engines for the Potrero Sugar Refinery. They are also furnishing large quantities of iron pipe, and are building a double cylinder 16x24 double-drum hoisting engine for a mine near Jackson, Amador Co., and a thirty-stamp mill complete for the Gold Blossom mine near Auburn. Recent shipments of the Johnston concentrator comprise five to Gibbonsville, Idaho, four to Salt Lake City and four to the Garcia mine, Mexico. A Bryan mill has also been sent to the latter named mine, one to Gibbonsville and one to the Bullion-Beck mine, Utah.

W. T. Garratt & Co. have just installed a fine pumping plant for Ryer, Eppinger & Thomas, near Rio Vista, consisting in part of a triple-expansion engine, 140 lbs. steam pressure, and two Scotch marine boilers, six feet diameter, eleven feet long. The capacity of the plant is 30,000 gallons per minute delivered eighteen feet high, through two hundred feet of thirty-six-inch pipe.

Pumping plants are being supplied by the Krogh Manufacturing Co. to the St. Chas. Hill mine at Downieville, the Throop mine near Stockton and the Jupiter G. M. Co. at Valley Springs. That company has also supplied a hoisting plant to the Rose Kimberly M. Co. at Shingle Springs.

The Pelton Water Wheel Co. is also busy, a dozen wheels having been lately sent out, including two to Petropolis, Brazil, each developing 300 H. P. under a 260-foot head. With this went 3000 feet of thirty-inch pipe.

Francis Smith & Co. have just completed a big job of making and placing twenty-two miles of iron pipe for the Oakland Water Co. from Alvarado to Oakland. From the wells to 23rd Ave. the pipe was thirty-inch; thence to Oak St., twenty-inch, the work being of more than ordinary magnitude.

Geo. E. Woodbury, who has removed to 143 First St., has sent several of his concentrators to points in Arizona, New Mexico and Colorado.

The Siemens-Halske Process for the Electric Precipitation of Gold from Cyanide Solutions.

By M. Eissler.

This process was in practical operation at the Worcester mine for several months, where I had the opportunity of examining it. At the Meyer and Charlton mine and at the Metropolitan the same will supersede the zinc precipitation method very shortly.

In 1887 Dr. Siemens, the eminent electrician of Berlin, found that the gold anode used in electro-plating at his works lost weight when standing in the cyanide liquor without any electric current passing through the bath. This fact, of course, hacked up the statements made by chemical authorities—that gold is soluble in cyanides, and induced him to try the use of cyanide solutions for the extraction of gold from ores.

He introduced the process in Europe, Asia and America, and during the year 1894 erected a plant capable of dealing with 3000 tons of tailings per month at Worcester mine, near Johanneshurg, Transvaal.

Why Dr. Siemens Adopted the Electrical Method.—He found that the zinc method as introduced hy MacArthur-Forrest only gave good results with strong solutions, while the electric precipitation was equally effective with either strong or weak solutions, and its efficiency was not lessened hy the presence of caustic soda.

The Action of the Electric Current on the Gold Solution.—The electric current decomposes a solution of metallic salt, the metal heing deposited on the negative pole, while the metalloid is liherated at the positive pole of the electrolytic cell. In a fixed time a given electric current will deposit a certain quantity of metal, which quantity varies for different metals in direct proportion to their electro-chemical equivalents. This law holds good only for solutions strong in metal; hut with very dilute solutions, as in use in the cyanide process, the current does not find sufficient of the metallic compound present at the electrodes, and consequently decomposition of the water also takes place. For this reason, to make the precipitatiou as great as possihle, constant diffusion of the solution is requisite.

In order, therefore, to create an artificial diffusion, a mechanical movement of the solution is important, and the most economical and convenient way of effecting this is to allow a slow hut steady flow through the precipitation boxes. But it is still more important to give a very large surface to the electrodes. In fact, a hetter effect is ohtained hy douhling the number of plates than by increasing the curreut tenfold.

CONDITIONS WHICH THE METAL CATHODE MUST FULFILL.

1. The precipitated gold must adhere to it.
2. It must be capahle of being rolled out into very thin sheets to avoid unnecessary expense.
3. It must he easy to recover the gold from it.
4. It must not he more electro-positive than the anode, in order to prevent return currents being generated when the depositing current is stopped.

The most suitable metal for the purpose is lead, rolled out in very thin sheets, which is therefore used in the Siemens-Halske process, and which meets all the requirements of the case.

The lead sheets are fastened in light wooden frames; there are three sheets of lead in each frame 2x3 feet, giving each frame a surface of eighteeu feet, and eighty-seven frames which are in each precipitating hox will expose a surface of 1566 square feet. Each frame holding three lead sheets at one pound weight each makes 261 pounds of lead in each hox.

The Anode.—No less important is the question of anodes. Iron anodes form Prussian hlue by the reaction hetween oxide of iron and ferro-cyanide. In consequeuce of this reaction, the amount of ferro-cyanide in the cyanide solution does not increase.

From the Prussian hlue the cyanide can he recovered hy dissolving it in caustic soda, then evaporating the solution, and finally smelting with potassium carhonate.

This last process has been carried out only on a small scale—about fifty pounds at a time—hut a nice, clean cyanide of potassium is ohtained. In the treatment of tailings this regeneration of cyanide is not of great importance, hut with concentrates, which decomposes the solution with formation of ferro-cyanide, it will effect a considerable economy.

ELECTRIC CURRENT REQUIRED FOR PRECIPITATION.

In order to precipitate the gold from cyanide solutions only a very weak current is required—that is to say, a density of ahout 0.06 ampere per square foot. With cathodes about one and one-half inches apart, seven volts is sufficient.

The advantages gained by using such a weak current are:

1. The gold is deposited hard on the plate.
2. The iron anodes are preserved for a long time, as their waste is in proportion to the current strength. In a plant treating 3000 tons per month, 1080 pounds of iron are destroyed in that period.
3. Little power is required. Seven hundred and forty-six Watts equal one-horse power. A 3000-ton plant requires 2400 Watts, equal theoretically to three and one-half horse power, and actually requiring ahout five indicated horse power.

ADVANTAGES OF ELECTRICAL PRECIPITATION.

The most important feature of electrical precipitation is that it operates on the solution quite independently of the amount of cyanide or caustic soda it contaius.

A solution containing 0.03 per cent of cyanide will dissolve gold just as effectively as a solution containing 3 per cent, provided a longer time is allowed for treatment.

It is my helief that the application of extreme weak solutions, such as are utilized in this process, will lead to important results in the treatment of the so-called rebellious ores, and that there is here a wide field open for investigation and research.

The vats hold 135 tons, and it takes five hours to fill them.

The tailings first get an alkaline wash of ten tons.

After this wash seventy tons of strong solution of 0.05 to 0.08 per cent is pumped on.

After this twenty tons of weak solution is pumped on of 0.01 per cent strength.

Total quantity of solution used 100 tons, and it takes five days to leach, filter and discharge each vat.

PRACTICAL WORKING RESULTS.

At the Worcester Works there are in use five leaching vats of twenty feet diameter with twelve-foot staves, each holding 3700 cuhic feet, 135 tons. One tank is discharged and filled every day. The strong solution used contains from 0.05 to 0.08 per cent cyanide, and the weak washes 0.01 per cent. The actual extraction of fine gold has averaged 70 per cent, while the consumption of cyanide has heen one-quarter pound per ton of tailings treated.

The precipitation plant consists of four hoxes twenty feet by eight feet wide and four feet deep. Copper wires are fixed along the top of the sides of the hoxes, and convey the curreut from the dynamo to the electrodes. The anodes are iron plates seven feet long, three feet wide, one-eighth inch thick. They stand on wooden strips placed on the hottom of the hox, and are kept in vertical position hy wooden strips fixed to its sides. In order to effect the circulation of the solution in passing through the box, some of the iron sheets rest right down on the bottom, while others are raised about one inch above the level of the solution, thus forming a series of compartments similar to those of a zinc precipitating box, the difference heing that the solution passes alternately up and down through successive compartments.

The sheets are covered with canvas to prevent short circuit. The lead sheets are stretched between two iron wires, fixed in a light wooden frame, which is then suspended hetween the iron plates. The hoxes are kept locked, heing opened once a month for the purpose of a "cleanup," which is carried out in the following manner: The frames carrying the lead cathodes are taken out one at a time. The lead is removed and replaced hy a fresh sheet, and the frame returned to the hox, the whole operation taking but a few minutes for each frame. By this means the ordinary working is not interrupted at all, and the cleaning out of the boxes, which is necessary in the zinc boxes, is only required at long intervals.

The lead, which contains from 2 to 12 per cent of gold, is then smelted into hars and cupelled.

The gold is deposited on the lead sheets as a thin hright yellow film which adheres firmly to the lead. The process of cupellation is too well known to need description.

The consumption of lead is 750 pounds per month, equal to 1¼d per ton of tailings. The working expenses are at the Worcester Works, treating 3000 tons per month, as follows:

	Monthly.	Per ton.
Filling and discharging leaching vats	£125	10d
Cyanide	75	6d
Lime	15	1.2d
Caustic soda	6	0.5d
Lead	14	1.1d
Iron	28	2.2d
White lahor	65	5.2d
Native wages and food	20	1.9d
Coal	57	4.6d
Stores and general charges	41	3.2d
Total	£450	or 3s

At a great many works, where correct sampling and assaying is carried out, the results—the gold won—agrees pretty closely with the assay results. At the Worcesters the following were the results for the month of August, 1894:

	Oz.	Dwt.	Gr.	
1350 tons tailings taken from settling vats containing	443	1	0	gold
1750 tons tailings taken from upper tailing dam containing	498	15	12	"
3100 tons tailings which, according to assay, contain	941	16	12	"
3100 tons residues which, according to assay, contain	239	7	12	"
Balance showing the theoretical output, or 74.6 per cent	702	9	0	
Actual gold won, or 74.1	697	15	15	

The tailings which were treated assayed from 6 to 8 dwts. The tailings or residues after treatment assayed from 1 to 2 dwts. The solutions which leave the precipitation hoxes still contain some gold, and the analysis in this case showed that the strong solution contained 4 dwts. 8 grains per tou of solution. The weak solution contained only 10 grains.

On an average in these works the strong solutions carry from 4 to 5 dwts., and the weak from 0 to 1 dwt.

In taking samples of the residues I would draw attention to the fact that the portion of the residues in which the largest proportion of unextracted gold is contained is near the hottom of the filter vat, say the last twelve to fifteen inches.

The hest way to sample is to take a sampling iron and probe every carload as it goes to the works, and do the same with every car as it leaves the works with the worked residues.

Miners' California Candlestick.

The accompanying cut is of a miner's candlestick as made hy the Cleveland, O., Lock Co. of hand-forged and wrought steel of enlarged gauge, with

MINERS' CALIFORNIA CANDLESTICK.

tempered points, but untempered stock, so in case they are dropped they don't break; also the hat hook is left soft, so it can he hent to suit tbe user. The candlestick spring socket is an especial feature, being light, strong, and can be sprung open hy pressing thumb knoh (on side) while holding in one hand and candle inserted with the other. This spring, as will be seen, has ornamented edges and made of finest spring stock. The hand bow is large and swagged into a half-round, just to suit the hand. They are made in two patterns, California (large bow hook, see cut) and Lake Superior (small double bend book). Plain hand forged, japanned, nickeled, and nickeled and engraved.

NEARLY 700,000,000 people carried ou American steamers during the last fiscal year and only 255 lives lost, of whom hut niuety-six were passengers, is the prominent feature of the new aunual report of Supervising Inspector General Dumont, of steam vessel inspection service. This, says the *Marine Journal*, is a smaller mortality among the same number of people, we have uo doubt, than if they had all stayed at home and went regularly to hed, to say nothing of traveling hy rail. It proves again what we have often remarked, that travel by American steamers, under the system of inspection now enforced, is the safest that could possibly be devised. Thirty-five of the ninety-six passengers above referred to lost their lives in one disaster, the sinking of the tugboat James D. Nicol off Sandy Hook on a Sunday in June last, and General Dumont states that this disaster was due solely to the fact that the tug was being navigated by a person wholly inexperienced.

That New Gold Saver.

We caution our miners not to place implicit confidence in the new gold process through which the owners claim they can secure more gold than a fire assay develops. A similar business was started in Denver about fourteen years ago. The pretended inventor went to a certain mine in which one millionaire was interested, made some tests, and informed the superintendent that he had discovered that two-thirds of the value of the ore had heen thrown away, the mill failing to reduce it and the fire assays failing to disclose it, and he wanted to sell his patent. The answer was: "Give me your formula. Let me work the ore for a month, and if such results as you claim are ohtained, the money will be paid you next day," and he offered to give a bond to cover the case. Tbe inventor declined and the invention fell through. It is easy enough to work a few pounds of ore aud to send the owner a return so magnificent as to cause his eyes to protrude. A five-dollar piece melted with the ore will do all that. But if a man is sincere, which we do not for a moment believe, hc will frankly say: "All right. I want so much for my process. Give me a contract tbat you will pay me that much, and I will turn over the formula through which you can do the work for a week or for a montb." When he refuses to do that it is fair to suppose there is a cheat iu the whole husiness; and the queer thing is tbat a cheat of this kind turns up once in about every fourteen years. One of the kind made a great sensation in Nevada ahout twenty-eight years ago. Another, as we said before, tried the same thing in Denver about fourteen years ago. Now we have a third one. By the way, we are not saying this last is not genuine. We are merely saying we believe it is an unmitigated fraud and would-be swindle.—Salt Lake Tribune.

Some of It Left Yet.

The actual amount of gold and silver that is used in a large plating establishment is very great, and the most strict economy is practiced in order that there sball be no waste. The extreme thiuness of the gold on cheap jewelry has long been a subject for jest by humorists. A party of Boston jewelers was being shown through one of the great plating factories hy the proprietor, a man well known as a wag. As the visitors stood looking into one of the vats where different articles were being plated witb gold hy means of a chemical process, a gentleman asked:

"Now, Uncle John, just how much gold do you use here in your business?"

The old man looked up and answered, with a twinkle in his eye: "Well, boys, I'll tell you. Wben I started iu fifteen years ago I put a $10 gold-piece into the vat, and I guess there's some left of it yet!"

A BILL is to be introduced in the next Congress to put the life-saving service on the same footing as the army in important respects. The hill provides for an increase iu the pay of the life-savers, for their retirement on half pay after a specified period of service or disability incurred in the service, and for a pension to the families of those who lose their lives in the discharge of their duty.

IN his annual report to the Secretary of the Treasury Superiutendent S. I. Kimball of the Life-Saving Service says that the number of disasters by reason of storms was greater than in any previous year since the introduction of the present system. The cost of the maintenance of tbe service during the year was a little more than $1,250,000.

The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XVI.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

1856.—In this year a San Francisco company commenced working at the Brea ranch, near Los Angeles, and attempted to produce refined oil from crude asphalt; the results were not satisfactory. Particulars of their operations are not obtainable at the present time.

1857.—W. W. Jeukins, W. C. Wiley and Sanford Lyon began to prospect for oil in Pico canyon, Los Angeles county. Francisco Lopez, a former steward at the San Buenaventura Mission, informed them of the operations of Andreas Pico, and they found "tar" (maltha) oozing from the ground, both in Pico canyon and in Hooper, Sespe and Piru canyons in Ventura county.

1861.—In 1861 Mr. Charles Morrill was engaged in San Francisco in importing and selling paints, oils and drugs. His store was on the corner of Washington aud Battery streets. During that year he commenced distilling oil from the maltha-saturated sands of the Carpinteria beds, near Santa Barbara. He sent from San Francisco a large steam boiler, by the steamer Senator. There being then at Santa Barbara no wharf, the sailors resorted to the expedient of plugging up all the holes and floating it ashore.

The bluff at the seashore rises forty feet above the water. In this he found a stratum of coarse sand saturated with maltha, lying about eight feet below the surface, and horizontal or nearly so. This he quarried out and submitted to distillation in an iron still. His plant was somewhat extensive and the product fairly good. The enterprise was not, however, a success, although the reason is not known. It is certain that it was a financial failure. In May, 1893, thirty-two years after, I saw the remains of his apparatus lying on the beach, which had been piped out from under the drifted sands, where it had lain since his works were abandoned.

1864.—No further special interest was taken in petroleum until 1864, when, in September, Professor B. Sillimau Jr. made a report to the California Petroleum Company, owning the Ojai ranch in Ventura county. All that part bearing on the oil and asphalt deposits of the State is here quoted:

"About ten miles nearly north of the old town of Buenaventura is a mountainous ridge, rising about 2000 feet in height and continuing for about thirteen miles. This mountain has the line of its crest running nearly east and west, aud it is bounded on the west by the valley of Buenaventura and San Antonio creek, while to the east it is cut off by the Arroyo de Mupu. Several smaller streams or dry canadas divide both slopes of this mountain into subordinate districts; but, viewed as a whole, the entire range from east to west is one great fountain of mineral oil or naphtha, oozing through the outcrop in oil wells which, losing the more volatile portion by evaporation, give origin to extensive deposits of asphaltum or mineral pitch, through which at numerous points the oil still penetrates and in the fervid sun of the region soon escapes by evaporation."

The Coast Range retires from the shore a few miles north of Buenaventura and leaves an open plain next the sea, widening in the direction of Los Angeles county, and offering for agriculture some of the best savannah lands on the coast. The oil range forms the boundary of this plain on the left hand, or toward the north, its ridge as already stated hearing almost east and west. The eye of the observer is at once arrested by its regular stratification, the line of its bedding appearing in the same horizontal plane across the furrows and intermediate valleys of the range.

These beds are seen to dip at a high angle to the north, measuring from seventy to eighty degrees from the horizontal, preserving a remarkable uniformity throughout the entire range. The rocks forming the oil series are generally thin bedded, easily split, and usually present on their up-turned edges no index of their true nature, since the most highly bituminized shales are weathered white at the outcrop, while others are turned red by the oxidation of the iron which exists in them as protoxide, carbonate weathering red or yellow, while others are yellowish from free sulphur or the yellowish sulphate of iron and other saline substances. Some of the beds of sandstone are buff-colored and form distinctly marked lines of a harder composition. The hammer soon reveals the true nature of the beds, the bituminous shales breaking black like coal shales, and shining with the lustrous varnish of asphalt. Thin beds of calcareous schists also exist, likewise bituminous and weathering whitish.

No fossils were detected in any part of this range beyond a few obscure impressions of plants without definite character, and yet seemingly reed-like. That the beds are cretaceous or Tertiary is pretty certain from evidence found in other parts of the Coast Range. It appears from researches of others that this zone or range of bituminous shales extends at intervals for 150 miles south of this. I have traced it as far as the Canada de la Brea in Los Angeles county, while it extends also at intervals to the north as far as Gilroy, in Santa Clara county, or about eighty miles from San Francisco.

In most of these cases the outcrops are too distant from the sea for advantageous working; nor do exudations of oil appear so encouraging in most other points, as in the Buenaventura district.

These facts are chiefly interesting, as they serve to show the streugth and persistence with which the rocks of this range were originally charged with the organic matter, whose transformation has produced petroleum. It is to be observed in this connection that the transformation of woody fiber into oil is a chemical change, takiug place always out of contact with the air and usually under water, but by no means necessarily connected with any particular geological period.

(To be Continued.)

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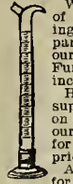

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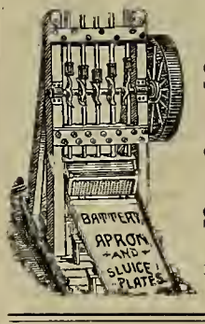

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Scientific Progress.

Tesla's Oscillator.

Tesla's latest invention, the "oscillator," is one of the most remarkable appliances of the age. It is described as being the core of a steam engine and the core of a dynamo combined, making a harmonious mechanical adjustment. This combination, says an enthusiastic admirer, constitutes a machine which has in it the potentiality of reducing to the rank of old bell metal half the machinery at present moving on the face of the globe. It may come to do the entire work of the engines of an ocean steamship within a small space they occupy and at a fraction of their cost, both of construction and operation. It will do this work without jar or pounding, and will reduce to a minimum the risk of derangement or breakage. There is nothing in the whole range of mechanical construction, from railway locomotives to stamp mills, which such an invention may not revolutionize. The essential characteristic of the machine is the application of the pressure of steam to produce an extremely rapid vibration of a bar of steel or piston, which, in turn, is so adapted to a set of magnets that the mechanical energy of the vibration is converted into electricity. The extraordinary result is that practically an absolutely constant vibration is established, and a power is obtained greatly beyond that obtainable in the most costly expansion engines using a similar amount of steam.

Besides saving in mechanical friction the 35 per cent of loss in the working of the engine, the 15 per cent of loss in belt friction, and the 10 per cent of loss wasted in the dynamo, making altogether an addition of 60 per cent to the available energy obtained from the steam for the purpose of producing electricity, it is simpler, lighter and smaller than the mechanism it is designed to replace, absolutely constant in its action, automatically regulated, and subject to the least possible amount of wear and tear. The utilization of this machine in any branch of industry would result in an appreciable lowering in the cost of production, and it is quite possible that its first general employment may be in electric lighting.

In the face of this marvelous invention a recent statement of Tesla seems hardly longer visionary. The young Montenegrin said: "I expect to live to be able to see a machine in the middle of this room and move it by no other agency than the energy of the medium in motion around us."

THOSE who discuss the history of accumulators find that there is practically no difference between a storage and a primary battery. The amount of energy that one pound of lead will generate, if wholly converted into lead sulphate, could be produced by about one-quarter of a pound of zinc or iron, or about half a pound of copper. Practically the very property of lead which at present constitutes its superiority to other metals—that is, the insolubility of its sulphate—at the same time limits its efficiency by reducing the energy obtainable at a small fraction of the theoretically possible amount. The active material requires a grid, and under the best conditions not more than half of the active material is really acted upon, the result being that not more than five to fifteen per cent of the total weight of electrodes is usefully employed.

AN effective and simple device has been patented for starting electric motors without the risk of burning up the armature coils at the moment of switching into circuit. This consists of a series solenoidal magnet coupled in circuit between the generator and the motor, the one end of the coil being joined to the core, which carries an arc lamp carbon. A lower carbon is connected to the outgoing lead, and when current is first switched on an arc is struck between the carbons. As the motor gets up speed the arc shortens, and when the current has fallen to its permanent value the carbons come together, as the lifting power of the solenoid is theu diminished below what is necessary to maintain an arc. This arrangement, if left in circuit, would also act as a safety cut-out in case of a short circuit or sudden load coming on the motor, checking its speed and greatly reducing its back E. M. F.

The Amount of Moisture in Steam.

A method of testing the amount of moisture in steam has been discussed by the Institution of Engineers and Shipbuilders, Scotland. The principle in this case, more particularly applicable to marine engines, consists in comparing the saltness of the steam with that of the water in the boiler. The test, as explained, is carried out by means of nitrate of silver, and the reaction is so delicate that, with only one per cent of salt in the boiler, one per cent of priming water can be accurately determined to the second decimal. To one part of salt boiler water there is added 100 parts of pure condensed water, and into this is poured a small quantity of concentrated solution of yellow chromate of potash; then a nitrate of silver solution containing about one-tenth per cent of this salt is slowly added. With each drop the salt water turns locally orange red, but this color disappears at first. Later on, when all the salt has been acted on, the whole fluid changes color from pale yellow to orange. The quantity of nitrate solution is noted, and then the experiment is repeated on the condensed steam from the engine undiluted with distilled water. The ratio of the quantities of nitrate of silver solution used in the two tests expresses the amount of priming in per cent.

Mining Stream Tin.

Stream tin, which is found in the Widdecome valley, in South Devon, England, is so called because it lies in long lines as if deposited by water and is the richest as well as the easiest to be found. At the vastly remote period when the granite was upheaved, and currents of water poured over its surface, sweeping away the overlying fractured beds, and then abrading its own surface, a great deal of its upper crust was washed away. Now, granite contains in it veins of tin These veins are not in themselves very rich, but when the water chumped up the granite it carried away the feldspar and quartz in a milky flood and threw down the heavy tin; the decomposed feldspar it also cast down, but far away in basins and lakes where were natural reservoirs. These were in time filled to the brim with the white feldspar, and they are now worked for china clay. This deposit is white as chalk, and the water that runs away with some of it in solution is like milk, and has a slightly sweet taste.

An Object Lesson.

A mining company yesterday shipped from this city to Latrobe for Oleta twenty tons of mining water pipe. From Latrobe to Oleta it is twenty miles. The charge for hauling the pipe that distance by team is $7 a ton, and teams were ordered to Latrobe yesterday to haul the pipe to Oleta to-day at $7.

Last night a telegram came to the directors of the mine in this city, saying that because of the effect of the heavy rains on the bad wagon roads the charge for hauling the pipe must be raised to $12 a ton, and the directors, recognizing the justice of the charge, acceded to the raise, and the pipe will be started from Latrobe to-day.

The extra cost for this single lot because of bad roads is thus seen to be $100. If the road from Latrobe to Oleta was even a half "good road"—and Amador county is rich in good road material—the charge per ton for hauling would not exceed $3 or $4 a ton, and in the worst weather not more than $5. So to a single firm of Amador miners the assessment on one lot of goods for bad roads is not less than $140. Does it pay to maintain bad roads?—Sacramento Union, Dec. 14th.

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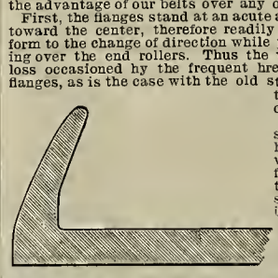

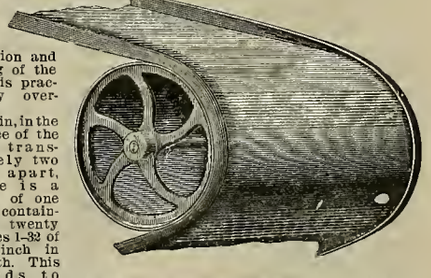

Again, in the surface of the belt transversely two feet apart, there is a space of one inch, containing twenty rifles 1-32 of an inch in depth. This tends to equalize the pulp and prevents it from hanking on the edges, or forming channels. This riffle saves fine sulphurets and quicksilver that would escape with the tailings from a belt with an entirely smooth surface.

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Mechanical Progress.

Heat Units and H. P. of Boiler.

By W. D. Browning, M. E.

A few days before the creation of Adam and Eve, heat came into existence. The days may have been thousands and thousands of years, we do not know, but that heat existed is evident from the fact that it is not all subdued at the present time.

That it was necessary to the formation of the earth and is a very desirable thing at present is also evident, yet it may be said that its true nature was not thoroughly understood until ages had passed since Adam's time. In fact not till the subtile mind of Sir Humphry Davie conceived that heat was not a material substance but "that the immediate cause of the phenomenon of heat was motion."

Still we know that things may be hot without being visibly in motion; hence, if heat is motion, the motion must exist in parts of the body too minute to be seen. These parts or molecules are held together by mutual attraction or cohesion and are in a continual state of agitation. The hotter the body gets the more vigorous the agitation until, with solids, the limit is reached, then on the addition of more heat the molecular attraction is overcome and the solid becomes a liquid. On still continuing the heat, further separation of molecules takes place, attraction is overcome and they fly off in all directions, the liquid becoming a gas. This we see in the action of some coals in the furnace. By the heat of more volatile matter the coal is heated, becomes pasty and part of it passes to a gas.

The transfer of heat from one body to another may take place in any of the following ways: namely, by radiation, conduction or convection. The heat from the burning coal is transferred to the crown and sides of the furnace by radiation, passes through the plates by conduction and the water is heated by convection. The process by which heat passes from hotter to colder parts of the same body is called conduction, and converted or "carried heat" is that which is transmitted from one place to another by currents.

Before quantities of heat can be measured we must have a "unit of heat," called a British thermal unit, which has been defined as "the amount of heat necessary to raise the temperature of water one degree Fahrenheit." Then for water at boiling temperature, under atmospheric pressure, the "sensible" heat=212°−32°=180°, or 180 units of heat would be necessary to raise one pound of water from 32° to 212°.

The "latent heat of steam" is defined as the amount of heat required to convert one pound of water, at a certain temperature, into steam at that temperature, and the "total heat of evaporation" is the sum of the "sensible" and "latent" heats and is defined as the heat required to raise one pound of water from 32° to the temperature of evaporation, and convert it into steam at that temperature.

The British thermal unit, liberated by the combustion of a given quantity of coal is mainly dependent upon its initial and final temperatures and densities of the confining elements.

The heat available for generation of steam depends upon the means taken to prevent the heat from being otherwise abstracted, and the only ways whereby it can be lost are by radiation into the atmosphere, from the furnace, and by the waste gases.

Furnace radiation may be reduced to a minimum but the temperature of the waste gases can never fall below that of the steam they are generating.

The heat utilized depends upon the temperature of the waste gases, when they pass from contact with the boiler, which should never exceed 600° to 550° Fahr. above that at which they enter the furnace. For example, the heat derived from a pound of good coal is about 14,500 B. T. U. (British thermal unit) and the waste gases at 550° carry off about 2850 B. T. U., so that there are but 11,650 units for steam generation and these may be much reduced before getting to the water.

Instead of dealing with an uncertain degree of heat, as is liable to be given off by the coal, because coals differ greatly, we might turn to the water side of the plates and work the units from tables on saturated steam.

The B. T. U. imparted to one pound of water in a boiler would be found opposite the pressure of steam, under consideration and under the head of "total heat," that is, the total heat from 32° Fahr. and at absolute pressure. (See D. K. Clark's Manual.) Suppose the total heat be wanted for one pound at 80 pounds, by gauge (95 abs.), feed 50° Fahr.

The total heat, from 32° to steam at 95 abs., would be 1180.3, and deducting the heat of the liquid at 50° (50−32=18), we would have 1162.3 B. T. U. necessary to raise one pound of water from 50° to steam at 80 pounds pressure.

As the temperature of the feed-water and the pressure of steam varies in different tests of boilers, and in order to compare the evaporation of one with another we must assume some standard.

This standard is given, called a "commercial H. P.," as the evaporation of 30 pounds of water per hour from a feed of 100° Fahr. to steam at 70 pounds pressure by gauge, and the total heat in one pound, according to above conditions, is also "rated" as 1102.5 B. T. U.

Then, knowing the number of pounds of water evaporated per hour during the test, the B. T. U. per hour may be found. The B. T. U. per hour divided by 30×1102.5 will give the H. P. of the boiler, on the commercial rating. Suppose the water evaporated per hour is 2400 pounds, then $\frac{1162.3\times2400}{30\times1102.5}=84$ H.P.

Of course, it must not be assumed that one H. P. in the boiler gives one in the engine.

Electricity for Tool Driving.

In a recent discussion of the question of substituting electric motors for shafting, this view was advanced: "Isn't it going to be cheaper to string a copper wire to a tool, have a small motor built with it, and drive by electricity, than it is to turn a long line of shafting several hundred feet in length, and keep it revolving day in and day out, whether there is any work being done at the other end of it or not? Some large shops have answered 'Yes;' but the art is still in an experimental stage, and no one really knows. It seems reasonable, and I am rather disposed to believe it. But whether the electrical breakdowns of the motor will more than counterbalance the mechanical breakdowns of shafting and belts remains to be seen."

GREAT accuracy has become an important factor in almost every kind of workmanship, and some mechanics are very expert in finishing work to the exact size called for by the drawings. Not long ago, in a Philadelphia machine shop, the head man was speaking of a device consisting of a short steel rod fitting into a hollow cylinder, the rod being three-quarters of an inch in diameter. The fit was so perfect that it would slide freely in and out, but it was found that if the rod were taken out and held in the hand for a few seconds, the slight expansion caused by the warmth of the hand was enough to make it impossible to insert the rod until it had been allowed by gradual cooling to regain its normal size.

THE coming additions to the navy yard at Washington will place its gun-making plant in the front rank of the world's ordnance factories. Two slotting machines for the very heaviest work will be added, also four horizontal boring and drilling machines to bore to the center of a sixty-nine-inch circle, a twelve-foot boring and turning mill, electric traveling cranes of the newest patterns and with supports and runways weighing 228,000 pounds. Besides these there will be four planing machines, 14x18 feet long and four and eight feet high and wide. Portable drills and special machinery of all varieties will be a part of the new equipment.

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Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

WHEELER PLACER.—*Republican:* Dr. Read of Amador City has organized a company to purchase the Wheeler placer claim at Pine Grove, for $25,000. Two thousand dollars has been paid, the balance to be paid in installments. The claim has every indication of being a rich one. Pans of dirt taken from all parts of the claim yield excellent prospects. An impounding dam is being constructed, and active mining by the hydraulic system will be inaugurated early next year.

A. Harpending has bonded the Kroning, near Plymouth, for $20,000, and the mining claim of S. H. Phillips on Indian creek, for one year.

THE SOUTH EUREKA—SUTTER DISTRICT.—*Record:* At the South Eureka over sixteen hundred feet of drifts and crosscuts have been run on the 900 level. During this prospecting a solid chimney of ore of more than 300 feet in length ranging from three to eleven feet in width, has been encountered, much of it being of a very high grade, running up into high value per ton. In addition to this an upraise was made of 120 feet, and the same grade of ore was found to the very top of the upraise. On the 500 level much prospecting was done. The ledge encountered was very large and extensive, but was of low grade, ranging from $2 to $7 per ton; but even with this showing, Supt. Parks of the Kennedy told the writer, more than a year since, that if the same grade of ore continued another five hundred feet, it would warrant the putting up of a sixty or eighty stamp mill. It seems, however, from present developments, that the ore body, as greater depth is attained, has steadily increased in richness and not decreased in size. No mine ever opened up on the mother lode in Amador county has made the showing at the same depth that the South Eureka now does. Even the famous Kennedy, located farther to the south, encountered no permauent paying ore body until the 1,100 level was reached. Another three hundred feet is now being sunk, which will bring the incline down to the 1,200 level. Preparations are now being made for the erection of a great milling plant on the property early in the coming spring.

Kern.

Californian: In the Rodgers mine at Agua Caliente, a ledge three feet wide has been struck which mills 2700 ounces of silver and $200 in gold to the ton. Twenty-six sacks—about 2500 pounds—sent to San Francisco, cleaned up $1800 in silver and gold.

Mono.

WORK AT THE STANDARD.—Bodie *Miner*: The cyanide plant has been closed down for the winter, as the tailings are frozen so they can no longer be handled to advantage. There was also difficulty in regard to the supply of water which, since the burning of the Standard Company's hoisting and pumping plant, has been quite scanty; and the building being this, the water in the tanks and pipes gave difficulty on account of freezing. The plant has been very successful and will re-open in the spring as soon as the weather permits.

The *Miner* is authorized by the Supt. to state, in contradiction of a recent statement in the Virginia papers, that the output for two months was about $16,000. At Green Creek the foundation and the piling of the dam is all in, and both water pipe and sluice pipe are in place. If the weather holds good for two weeks more the dam will be in perfectly safe condition for the rest of the winter. The dam is a crib dam, rock filled; and has been built up about six feet. An additional force of twenty men recently came in from Carson, and other points along the road, and the large force now at work will push the work to a speedy completion. The break in the company's ditch, which has compelled a temporary suspension of work at the mill for want of power, fortunately occurred below the dam. The mill is now accumulating a stock of ore and will resume operations in a day or two. The company has paid out during the month of November the sum of $28,300, the larger part of which was on the pay roll.

Plumas.

NEW MINING ENTERPRISE—*National-Bulletin*: Gullic & Co. have opened up the tunnels on the old Pennsylvauia quartz mine, now called the Hibernia, south of Greenville. This property was prospected in a crude manner, twenty-eight years ago, then paying $5.50 per ton. In those days, considering the crude and expensive methods employed in working ores, such returns were considered too small to attract much attention. Working of the property ceased, and it passed into the hands of the late Henry O'Toole, who afterwards received a government patent to the mine under the name of the "Hibernia." Mr. O'Toole had many offers for the property, but would not sell, hoping to be able to work it himself. Adverse circumstances and ill health prevented him from so doing. Just before his death, about two years ago, he deeded the mine to his brother James, who nearly a year since bonded it to Gullic & Co., and they have opened up the property in four different tunnels and places, showing ore veins aggregating twelve feet in width. They made a thorough test in a stamp mill, the ore yielding $5.90 per ton. It is all free milling.

Gullic & Co. have taken the property and made agreed payments. Last week over twenty men were employed in building roads and doing other necessary work. Being satisfied that the mine will pay a good profit, the new owners, during the winter, will open it properly, and next spring build a twenty-stamp mill buying the latest and best machinery.

Riverside.

PINACATE MINING DISTRICT.—At the Alice there is a fifty-foot vertical shaft and seventy-foot incline in a good body of ore, with considerable upon the dump. Preparations are being made to put up a mill. Twenty dollar ore has been taken from the Briggs mine, about fifteen miles from Perris, in a southeasterly direction.

At the Mouifee several shafts have been sunk, and considerable $20 ore run through the five-stamp mill. But with the ore being crushed as fine as it is, but little is run each day.

At the Missing Link the necessary hoisting and pumping machinery has been put in and the shaft is down 200 feet. The ore taken from this has averaged $18 a ton.

The Golden Chariot is a promising mine on on the same vein with the Santa Rosa. The Santa Rosa iu a comparatively old mine, having been worked by Mexicans with arrastras. There is now a ten-stamp mill there, with power for twice this number of stamps. At the bottom of the 200-foot level a drift has been run south for 300 feet, all good ore. The machinery and equipment is excellent, and is owned by the same men having the Good Hope. It is eight miles from Perris, which is thoroughly modern in all its appointments. It is being worked most at the 430-foot level, though at 530 feet there is being opened a drift through good ore. All the rock taken out is rich enough to pay for working. At the 430-foot level the vein bas been explored for a long distance, without any indications of a termination. It is estimated that the present product is about $30,000 a month, hut as there is some ten tbousand tons of ore in sight, and is expected to double the mill capacity, the output will be greatly increased. This mine has been worked for about fifteen years, Mexicans locating it and working it with arrastras.

At the Santa Fe, another old mine, first worked by Mexicans with arrastras, the five-stamp mill from the Temescal tin mine has recently been set up, and is crushing fine ore. The owners believe that they have a bonanza in the mine. The great beauty of tbis mining district is tbat it is located in the midst of good farming lands and near the railroad, with plenty of water, wood and coal easily obtainable.

Siskiyou.

MINING NOTES.—*Journal:* Several claims have been located lately in Cottonwood district on the quartz ledge known as the porphyry dyke. which extends a long distance and prospects very rich. Throughout the entire limit of the Cottonwood district, many quartz and placer locations have been made, and also in the adjoining Hungry Creek, Ashe Creek, Fool's Paradise, and other mining camps along the Klamath river, at the base of the Siskiyou mountain foothills.

As soon as the cool weather now prevailing moderates, to start the snow melting, there will be an abundance of water in all the small streams and ditches to commence work in hydraulicking, ground sluicing and sluicing, to wash up piles of pay gravel accumulated during the dry summer and fall months. besides uncovering vast beds of pay gravel under the high banks along the various gulches, ravines and streams. The winter so far has been good for mining, by the piling up of considerable snow on the mountain summits to dissolve duriug the warm days of winter, spring and summer.

Trinity.

THE UNDERGROUND TREASURE MINE.—*Journal:* P. Holland of Trinity Center was in town Thursday and brought with him a portion of his last clean-up from the Underground Treasure mine on Coffee creek. It was as pretty gold as one would wish to see. He had it in two parcels, one, which he calls fine gold, consisted of pieces about the size of a finger nail; the other of nuggets weighing from one half to two ounces. It makes the man looking at it thiuk he is in a miuing county.

Mr. Holland's mine is situated on the East Fork of Coffee creek ahout four miles from its junction with the main creek. He owns about three miles of the bed of the creek, which he has been working since 1877. principally drifting till last seasou, when he opened his mine on a more extensive scale. He has constructed a reservoir with a dam seventy-five feet long, thirty feet wide at the bottom and twenty feet at the top and sixteen feet deep. The gate is a self-shooter twelve by fourteen feet and discharges about 31,000 inches of water for ahout five minutes. This immense body of water rushes down the creek with great velocity, throwiug big boulders iu all directions. He has a large derrick on the mine worked by an overshot water wheel.

The gold is coarse and easily saved. It is a valuable property and, in the hands of capitalists who would work it on a large scale, would add materially to the gold output of the county.

NEVADA.

The *Silver State* says a rich strike has been made in the Coyote mine, Kenuedy district, lately purchased by C. A. Norcross, an average taken from the pay streak assaying $261 in gold per ton.

KENNEDY MILL AND MINES.—*Reveille:* At Kennedy the miners employed by the Imperial Company have accepted sixty-five cents on the dollar for fifteen days' work; the mill men have refused to settle only on the basis of dollar for dollar, and the company has shut everythiug down. The superinteudent is in Winnemucca.

ESMERALDA COUNTY.—This district is seven miles south of Soda Springs in Esmeralda county, at an altitude of 7,000 feet. Wood is plentiful; two springs supply the camp with water, also the five-stamp mill of the Douglas Miuing Company.

In the last fourteen months 125 mining locations have been made, several of which have been developed into paying mines. One of these is the Hardscrabble, which recently cleaned up $10,000 in gold from 125 tons of ore, and there is enough such ore in sight to keep the mill running for a year. The Orphan Boy ore works $30 per ton; the New Party ore $45 per ton; the Julia $25 per ton; the Snowball $25 per ton; the Fortuna $25 per ton; the Hardluck $30 per ton, and the Oneida ore is reported to be worth $200 per ton. The ores of the district are free milling and $10 ore has been worked at a profit. So far 400 tons of ore have been worked and the bullion produced and shipped was worth $16,000. The Douglas Company is making arrangements to run the mill day and night as well as all the mines above named are bringing in ore.

At present there are seventy-five men in camp, many of whom are working on leased mines. There are many ledges, the most prominent of which can be traced five miles by croppings.

FORMATION OF SILVER MINES.—*Silver State:* The process by which nature forms her silver mines is very interesting. It must be remembered that the earth's crust is full of water, which percolates everywhere through the rocks, making solutions of the elements obtained from them. These chemical solutions take up small particles of the precious metal, which they find here and there. Sometimes the solutions in question are hot, the water having got so far down as to be set boiling by the internal heat of the globe. Then they rush upward, picking up the bits of metal as they go. Naturally, heat assists the performance of this operation. Now and then the streams thus formed, perpetually flowing hither and thither below the ground, pass through cracks or cavities in the rocks, where they deposit their loads of silver. This is kept up for a great length of time—perhaps thousands of years—until the fissure or pocket is filled up. Crannies permeating the stony mass in every direction may become filled with the precious metal, or occasionally a chamber may be stored full of it, as if a million hands were fetching the treasure from all sides and hiding away a future mine for some lucky prospector to discover in another age.

STOREY CO.—In the Savage, on the 1000 level, in the north lateral drift from the east drift, they continue to extract ore from the sill floor up to the eighth floor. The east crosscut started from the face of the south drift was advanced 50 feet and connected with the east ore stope from the 1100 level. The north drift from the station is advanced 25 feet; face in clay and porphyry. On the 1050 level, in the south drift started from the east drift 30 feet from the south ore stopes, they continue to extract ore of fair grade. They have sunk a winze in this ore 14 feet, all in ore of fair grade. This winze is being sunk to connect with a south drift from the sixth floor, which is now advanced 25 feet. At a point 25 feet back from the face of the south drift they have started an east crosscut and advanced same 10 feet; face is in quartz showing spots of ore. During the week they have hoisted 133 cars of ore. Shipped to the Nevada mill 135 tons and milled 125 tons. Car samples average $27.50 per ton. Battery samples average $20 per ton. Bullion yield for the week, $1582.50. Shipped to United States Mint at Carson, December 17th, 150 pounds of bullion of an assay value of $3427.57.

ALASKA.

John Healy, of Juneau, Alaska, recently visited Montana friends, says the *New Northwest*. He was a former resident of this State, but for the past few years has been an Alaskan, interested in business at Juneau and in navigation and trading on the Yukon, with posts at Fort Cudahy and Selkirk, 1,600 and 1,850 miles respectively from the mouth of the great northern river. One of the company's boats, of 400 tons burden, plies the waters of the Yukon to the head of navigation, Selkirk. The country about Fort Cudahy is a placer mining region, the diggings being on small tributary streams of the Yukon. As high as 1,100 ounces of gold has been washed from the auriferous ground in a single week's run. One hundred dollars to the man per day has been more commonly realized, and ounce diggings is more frequently averaged. The winters are rugged—colder at times than experienced in Montana. The most serious drawback to mining operations is the shortness of the season adapted to that kind of work. Mr. Healy carries in his pocket specimen nuggets not unlike many dug from Montana placers. The largest nugget of which he has knowledge, washed from the Alaskan diggings, was of the value of $504. Of course, Yukon navigation is closed ahout half the year.

ARIZONA.

Two concentrators have been added to the Crowned King mill, making eight in all, now in. New plates have also been put in the mill and the machinery has been put in thorough repair, and everything is now in readiness for starting except water. When water supply is obtained the mill will he started and kept in operation as long as the water lasts. New ore bodies have been opened up in the mine, and the property is said to he looking better than ever in its history.

The Goodenough mine in Santa Maria district, continues to improve. Mr. Thorne says that preparations are being made to start work again on the Austin group. A number of prospectors and miners are at work in the district on claims of their own, and are meeting with good success. Arrastras are being used for the reduction of the ore taken out by them.

The rest of the machinery required for the Bucyrus steam dredge and amalgamator of the Lynx Creek Hydraulic Company has been placed in position, and the big machine is at work again tearing down the rich gravel beds and separating the gold.

J. W. Wentworth, of Payson says: The Zulu property, in Tonto Basin, has loomed up as a mine of the first magnitude. It's a peculiar mine. On the surface, it was simply an aggregation of stringers, low grade and sulphuretic. But the owner, Samuel Hill, of Prescott, felt assured that something of value lay beneath, so pushed the work downward. He was justified in his faith, for now, at 200 feet depth, they have a compact ore body seven feet wide, averaging $40 to the ton. And the curious part is that the ore is all clear quartz, absolutely free milling, not a trace of baseness being noted. There is a seven stamp mill on the property.

ON THE AGUA FRIA.—Prescott *Courier:* W. L. Roberts, who built the five stamp quartz mill on the Agua Fria, has met with such marked success that he has increased the capacity of the mill to ten stamps and changed his eight-foot wheel to a ten-foot wheel. He has water power enough to run a sixty-stamp mill.

O. B. Marshall and J. C. McDonald leave to-day for their Mammoth mine, Copper Mountain district, with a wagon load of mining tools and supplies preparatory to a long siege of development work. This ledge is sixty feet wide and samples $16.36 per ton across the ledge. The ore is free milling. Near by is plenty of timber and the Agua Fria river with water enough to run a large mill by water power.

MEXICO.

MEXICAN TIN MINES.—The Pittsburg and Mexican Tin Mining company of Durango, Mexico, has increased its machinery equipment for the treatment of ore from its mines, which it is said yields an average of four per cent pure metallic tin and is found in unlimited quantities. On June 9th the production was said to be about fifteen tons of metallic tin a month, hut work was suspended until October owing to the building of additions to the plant. The present capacity of the works is sixty-four tons of ore per day, which means a production of about three tons of metallic tin. This will soon be increased to eighty tons per day. The company has in all six prospects and three mines. The prospects have been tested to a depth of from twenty to fifty feet and the mines from 150 to 300 feet.

MONTANA.

The profits of the Anaconda company for the year just drawing to a close are estimated at upwards of $2,000,000, and the Boston and Montaua will show a net earning of at least $750,000, or $5 per share.

SOUTH DAKOTA.

THE RICHEST SPOT.—*Chronicle:* The region known as the Southern Hills is coming to the front as a rich gold bearing section. The old and time worn saw, so frequently heard: "There are no valuable mineral deposits in the Southern Hills," has been relegated to the rear by the discovery of the richest mines of the Black Hills region within her limits. It is hut a repetition of all mining countries; the richest portions are always run over to secure the conveniently acquired surface product, which must he exhausted before considerable effort is made to explore the hidden depths of nature's mineral treasury.

IDAHO.

PIERCE CITY DISTRICT.—Wallace *Miner*: The old Oro Fino mining district, the oldest gold camp in the West, we believe, outside of California, has been the scene of considerable activity during the past summer, and the future for it is brighter than it has been for years past. Up to two years ago the district had been almost abandoned by white men and practically given over to Chiuamen. The past summer has witnessed a marked improvement. Nearly 150 men have formed what may he called the permanent summer population of the camp, and there have been prospectors coming and going by the score. There are probably 100 Chinamen in the district, most of whom are in Pierce City.

Although in this county, Pierce City is a long distance from the Cœur d'Alenes. It generally takes ahout four days and a round-about journey of 300 miles to make the single trip. Pierce City is nearly seventy miles from Kendrick, the nearest railroad station.

No less than six hedrock flume enterprises are under way in the district. The work has been vigorously pushed during the summer, hut it has been mostly in the direction of getting ready, and no amount of gold can be taken out till next summer. But they give promise of heing great money makers.

Quartz has received a great deal of attention, and a number of good ledges have been located. Four or five of these are being developed during the winter, and on one of them a prospecting stamp mill has been in operation since last August.

Individual placer mining has been largely followed. Pierce City mining district covers a large area, and every creek and tributary in it yields gold. Old ground in some cases has been worked over, and numerous patches of new and rich placer have been discovered. Dozens of men, many of them inexperienced in mining, have gone in there during the summer, taken out sufficient gold to live on and returned to the outside with enough to tide them over the winter. While there is nothing big about this, it is a most independent way of enduring the hard times. And while there is nothing to excite a rush to this district, it is a most promising field for the prospector and a place where hundreds of men hy industry can be assured a living and fair remuneration.

It is estimated that over $100,000, probably $125,000, has been taken out there during the past year. The hedrock flumes and other work under way this season will largely increase that output next year.

Thirty-five or forty white men have made arrangements to winter there.

Coast Industrial Notes.

—The C. & C. Ry. Co. will build a new line of road from Winnemucca, Nev., to the new and promising mining camp of Kennedy.

—A carload of sequoia giganten lumber was shipped from Fresno last Monday to Europe, via New York, to be used in making lead pencils.

—The oyster-plant experiment in Willapa bay, Wash., is successfully begun at Bay Center, where a protection reserve of ten acres has been set aside.

—According to the Lodi *Review-Budget*, a project is on foot to build an electric railway between Lodi and Stockton, and rights of way have been secured.

—The McGlew Concentrator Co. has recently sent one of their machines to Mazatlan, one to L. P. Drexler in Oregon, and another to Silver City, Nev.

—Parke & Lacy have recently shipped a Dodge pulverizing plant to the Sahguah C. M. Co., Yuma, Arizona, and a complete outfit of rock drills to Alaska.

—A new diamond coal drill, capable of going down 2700 feet, will be used to test the existence of coal in the vicinity of Scow bay, opposite Port Townsend.

—The Oakland estuary has been dredged for a mile, making a channel 300 feet wide and six feet deep, in the bottom of the bed, by the United States Government during the past year.

—The Cal. Navigation and Improvement Co. have renewed the enterprise of twenty-five years ago, and opened steamboat navigation on the San Joaquin and Tuolumne rivers as far as Modesto.

—In Santa Barbara county a company has been organized to sell water at $1000 an inch. Two hundred prospective purchasers have already agreed to pay that price, the water to be used for irrigation. It is a little high.

—The Thorpe Mining Company filed articles of incorporation in this city last Wednesday. Directors—G. A. Schuster, C. A. Ingerson, F. Ench, J. C. Bauer, Robert Z. Johnson, L. Allgewahr and F. H. Rosenbaum. Capital stock, $500,000.

—A cedar tree 407 feet in height and measuring seventy feet in circumference at the base was felled last week near Ocosta, Wash. It was sixty feet to the first limb of the tree, and the limb itself was seven feet in diameter. It is estimated that the tree will furnish 100,000 feet of boards, enough to make over 100 carloads of shingles.

—Dr. Emmon's two-foot gauge railroad is in rapid process of construction from Amador toward Gnlt. It is the first road of that gauge in this State, and its first cost and running expenses are, of course, very light. The passenger cars are fifty feet long and six feet wide, and will seat thirty people. The money needed for its completion and equipment is furnished by Chicago men.

—J. A. and B. A. Jeffrey, of this city, have secured a patent for an electric dental engine, a case swiveled upon the outer end of a bracket, within which a motor armature rotates; a two-part shaft, upon one part of which the motor armature rotates within the case, while the other is journaled in a sleeve, and a clutch connection between the parts of the shaft.

—A Seattle, Wash., press dispatch says the whole Newcastle coal mine appears to be on fire, and it is feared that the mine will become a total ruin, involving a loss of $500,000 to the Oregon Improvement Company. Coal creek is pouring into it, but will take several weeks to thoroughly flood it, and when the fire is extinguished it will take four or five months to pump the water out. About 250 men are thrown out of work.

—The Golden State and Miners' Iron Works is building a Harding 80 H. P. marine gas engine for one of Hayward's lumber schooners. This is believed to be the largest gas engine ever built in this State. They have recently sent a complete plant to the Altoona Quicksilver Co., in Trinity Co., and two sectional outfits, comprising stamp mills, etc., to Guaymas and Mazatlan. They are building a Ball valve engine, 24x30, for the Caspar Lumber Co., of Mendocino Co.

—"The San Diego Pacific Railroad" is a new scheme now flooding the mails with prospectuses directed to railway employes. It is called by its projectors "a railroad for railroad men," and the idea as set forth is to issue stock at $10 per share, payable in monthly installments of 50 cents. The promoters desire all railroad employes to become stockholders in the road, which will be built from San Diego, Cal., east, and they figure that if 100,000 employes take stock, it will furnish capital sufficient to build five miles of the road per month. The A. R. U. strikers who are on the black list are particularly invited, as it will afford them employment.

—In Tulare the Sunset irrigation district people have let a contract to the amount of $1,500,000, and an equal amount of bonds was sold at par. The deals were made with P. Y. Baker of Traver, who represents San Francisco capitalists. The main canal to be constructed will be about twelve miles long, which is expected to carry water enough to irrigate 300,000 acres of land. Less than one-half the land will be reached by water running in the ditches in the ordinary way, and for the remainder a system of pumping plants will be put in to overcome the rise, pumps being used capable of lifting 120 cubic feet of water per second. The water will be taken from the North Fork of Kings river.

—The U. S. S. McArthur is now at the dry dock of the Fulton Engineering and Ship Building Works having a new copper plating put on. Soon after New Years she and the Gedney will begin a new survey of the entrance of San Francisco bay. The Golden Gate has not been surveyed for more than a generation. The captain of the Gedney says: "The Sacramento river emptying into the bay with its debris for fifty years is bound to make many changes, and the Government has decided that the best course to pursue to prevent accidents is to make a new survey of the whole entrance. The bar is in a bad condition and the pilots are beginning to doubt their old charts, so many differences do they find. There is a possibility of the bar becoming impassable. In that case dredging would be out of the question, and a jetty would have to be built which would cost an enormous sum of money. Of course we know nothing concerning it now, but will soon find out when we get to work next month."

—H. E. Huntington proposes to use an immense water system in San Bernardino county. He says: "We shall use the water from the Mohave river, taking it out of the river four miles above Daggett. We already have four miles of main canal built and seven miles of laterals, putting about 1500 acres under irrigation. The land has been experimented with sufficiently to prove that it will grow vegetables of all kinds and deciduous fruits. As soon as the rainy season is over we shall put in a submerged dam and have works planned which will cost $300,000 or $400,000. There will be tributary to our system about 240,000 acres of land, though it will take several years to put it all under irrigation. We will develop power there, too. Near Mineola, our new town, there will be a waterfall of a vertical drop of 100 feet. Out of every 1000 inches of water we are going to get 250-horse power engines, which will be used to drive the machinery at the mines in the Calico district."

—J. Norbom, attending to the mining machinery department of the Joshua Hendy Machine Works, who has just returned from El Dorado county—where he has been superintending the erection of mills built by his firm this fall—reports they have built a forty-stamp mill at the Lucille mine, at Plymouth, Amador Co.; twenty stamps at Nashville, El Dorado Co.; five and ten-stamp mills in Grass Valley; ten-stamp mills in Siskiyou and Calaveras counties; and are now building fifty stamps at the Grand Victory mine, El Dorado, and adding ten stamps to the present mill at Oro Fino mine, El Dorado Co., besides several hoisting and pumping plants. The mills above referred to are all having very heavy stamps, 1100–1200 pounds, using short drop, to enable the camshaft to run at a high number of revolutions, thereby giving the stamp a quick drop, increasing the splash in the mortar and causing a greater discharge. The new mortars gotten up for this kind of mill are very heavy and longer than the old-style mortars, giving them about twenty-five per cent more screen surface than usually has been the custom.

A thoroughly competent Amalgamator wants a position where mine and mill assaying is required. References given. Address Box D, this office.

RUPTURE!

It has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

DELINQUENT SALE NOTICE.

GARNER CONSOLIDATED GOLD MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Mokelumne Hill Mining District, Calaveras county, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the 26th day of October, 1894, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amount.
W. T. Robinson.....	7	25,000	$1,250 00

And in accordance with law, and an order from the Board of Directors, made on the 26th day of October, 1894, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 56, No. 309 Montgomery street, San Francisco, California, on THURSDAY, the 27th day of December, 1894, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. STADTFELD, JR., Secretary.

Office, Room 56, No. 309 Montgomery street, San Francisco California.

OUR PIPE IS FOR SALE.

For Hydraulic Mining and Irrigation Purposes Our Sheet Iron and Sheet Steel Riveted Water Pipe Is Unexcelled.

We Have Also a Large Line of the MATHESON JOINT (Lap-Welded) Pipe, for Which We Are Agents.

Our Prices Are Low; Our Pipe Is Superior, and We Want More Business. May We Quote You Prices?

PIPE FITTINGS, TOO.

RISDON IRON WORKS,

SAN FRANCISCO, CAL.

CLEVELAND RUBBER WORKS
GUARANTEED SUPERIOR IN STRENGTH OF DUCK FRICTION, PURENESS OF GUM, DURABILITY & FINISH.
STRETCHED.
WARRANTED 2-X-L
TRADE MARK
CLEVELAND O.
WARRANTED NOT TO PEEL, CRACK OPEN AT THE SEAM, NOR SEPARATE BETWEEN PLIES OF DUCK.
OF THE MECHANICAL RUBBER CO.

Simonds Saws and Machine Knives.

Rubber Belting, Hose, Cotton Hose, Packing.

Leather Belting.

Dodge Wood Split Pulleys.

Emery Wheels, Files.

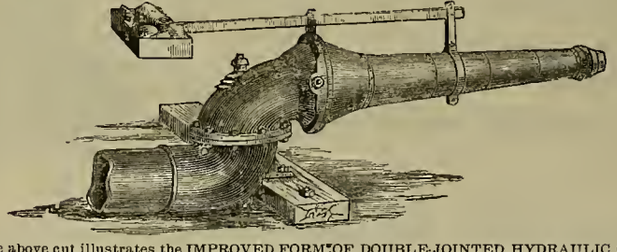
Graphite and Graphite Grease.

Covel Belt Hooks.

SIMONDS SAW CO.,

No. 31 Main Street, San Francisco, and 85 First St., Portland, Or.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

Send for Price List.

THE JUDSON
Dynamite and Powder Co.

— MANUFACTURERS OF —

Dynamite and Blasting Powders,

200 Market Street, San Francisco.

DIRECTORS—Alvinza Hayward, Jos. Knowland, Bartlett Doe, C. S. Benedict, Ed. G. Lukens (President).

NEW METHODS. **STORAGE BATTERIES.** NEW RESULTS.

THE HOUGH STORAGE BATTERY opens a new era in electrical development. We are now prepared to fill orders for complete plants for lighting or power. Residence lighting now an economical success. Stores, warehouses, mines, mills or street railways at reduced prices. Estimates furnished. Correspondence solicited.

EUREKA ELECTRIC CO.,

42 SPEAR STREET.....SAN FRANCISCO, CAL.

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION,
532 California Street, Corner of Webb.

For the half year ending with the 31st of December, 1894, a dividend has been declared at the rate of four and eight-tenths (4 8-10) per cent per annum on Term deposits and four (4) per cent per annum on Ordinary deposits, free of taxes, payable on and after Wednesday, the 2d of January, 1895.

LOVELL WHITE, Cashier.

INVENTORS, Take Notice!
L. PETERSON, MODEL MAKER,
228 Market St., N. E. Corner Front (Up Stairs), San Francisco. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential*.

DIVIDEND NOTICE.

THE GERMAN SAVINGS AND LOAN SOCIETY,
526 California Street.

For the half year ending December 31, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after WEDNESDAY, January 2, 1895.

GEO. TOURNY, Secretary.

PATENTS
DEWEY & CO.,
220 Market St., S. F.

Electrical Progress.

Destructive Arcing of Five Hundred Volt Fuses.

Read before the American Street Railway Association, Atlanta, Ga., Oct. 18, 1894, by W. E. Harrington.

The destructive effects of the arc accompauying the opeuing of 500-volt circuits and switches, lightniug arresters and fuses has led the writer to inquire into this phenomenon, particularly iu reference to fuse practice. A series of carefully couducted tests were made to find the relatiou. between the fusing curreuts of different size copper wires ranging from No. 30 to No. 21, Brown & Sharpe gauge, the time required to open the circuit, and to what extent the arc contributed to the time required.

Au iuclined trackway was constructed, haviug two copper tracks upon which a traveler consisting of a block of hard wood having copper plates in contact with the tracks could be run, the circuit from rail to rail of track being completed through an electro-magnet on top of the traveler. Parallel with and alongside of the track was a raised board on which a paper was attached.

An impress was made on paper by a lever on the traveler when relcased by electro-magnet, owing to stoppage of current.

Before tests were made the trackway was carefully calibrated as regards time for travelcr to go from top to bottom and the intermediate points, resulting iu knowing the time to $\frac{1}{100}$ of a second.

The tests were conducted across the bus bars of switchboard of the Camden Horse Railroad Compauy, Camden, N. J. Average voltage, 515 volts.

Before throwing a fuse in circuit, a water rheostat was set, usiug a Weston ammeter for this purpose, so that the current desired would flow through the fusc, when the circuit was completed by the traveler on the trackway.

The different size fuse wires were subject to the followiug limitations: The time of the traveler running full leugth of the trackway, 1.5 seconds; the current rangiug from 20 to 130 amperes iu 10 ampere steps.

The smaller fuse wires would fuse with the minimum current of 20 amperes, and in all iustauces inside of 1.5 arc limit, consequently the curves show a wide range; but in the larger size wires a greater current was required to fuse the wires iu the 1.5 seconds limination, consequently the curves giveu for the larger fuse wires show less and less range as the fuse wires increase in size.

Iu order to strike an average the tests were repeated under similar conditious as regards current and gauge wire with a three-inch horizontal fuse, a six inch vertical fuse, both of which were connected to a standard form of fuse block, also a four and one-half iuch fuse, the average in leugth of the three inch and six inch, was employed, connected in a specially constructed fuse block, which absolutely prevented any arcing of the terminals. In other words, the fusing of the fuse wire could uot burn the terminals to which it was attached. The results give the time required in fractions of a second for the circuit to be opened under identically similar conditions as regards current and gauge of wire for a three inch, a six inch unprotected and a four and one-half inch protected terminal fuse.

The curves illustrate excellently the erratic character of the fusing of wires under conditions as observed in the practice of to-day.

The time required to open a protected terminal fuse wire becomes less and less as current increases and grows less regularly, showing that a regular law is followed. The curve is a hyperbola having its asymptotes for its axes, and the equation for it is $xy = 13$ for No. 28 copper. Whereas, the two unprotected terminal fuses are uncertain and show in a very pronounced manner wherein the terminals contribute to this eud, the conclusion one is forced to draw is that a fuse wire in practice, when it fuses, does not do as it was intended to—open the circuit—but establishes a condition, though the time may be limited, wherein the terminals act as a magazine to furnish the gas through which the circuit is continued. The curves throughout do not show any superiority of the six inch fuse over the three inch. Looking at the results in comparison, as given by the Board of Fire Underwriters, which is attached to this paper, the very point they should have observed was overlooked, to wit, the continuauce of the arc through but a short period of time at the expense of the terminals, and the possibility of the vicious gas thus generated coming in contact with other circuits and establishing other and more serious conditions, such as short circuits and possible fires.

Not to be misunderstood, while the tests, as are herein recorded, show no superiority of the six-inch unprotected terminal fuse wire over the three-inch uuprotected terminal fuse wire, the six-inch fuse wire is uuquestionably safer wheu conditions are more extreme, such as, for instance, wheu a short circuit occurs.

The determining factor in this matter of fuses is: What are the conditions required to protect against absolute short circuits across the bus bars of a large power station 500-volt switchboard? Tests are conducted showing how fuses act under conditions that are predetermined, certain currents which are made to flow, etc., but you uever see anything published or advice given in this matter of fuses for the condition which really occurs the most frequently—that is, absolute short circuits. The Board of Fire Underwriters' report, herewith attached, gives the differeut length fuse blocks required for 10 amperes, 20, 30, 40 and so on.

Now the requirements aud limitations as prescribed iu the Board of Fire Underwriters' report are true and perfectly safe when the fuse "blows" under the conditions as outliued in the tests, as made by the committee appointed to make such tests.

But on an absolute short circuit across bus bars, as above stated, a ten-ampere fuse block constructed as specified will, instead of protectiug one when most iu ueed of such protection, burn up in the most vicious way aud will opeu maguetic cut-outs in a power station requiring currents up to a 1000 amperes to open. Understand, the fuse does not itself do this, but the arc established at the expense of the terminals is the immediate and sole cause, and the circuit must be opeued elsewhere. As stated, the magnetic cut-outs, above referred to, open the circuit.

This matter of arbitrarily adopting a series of fixed dimensions and conditions uuder which fuses are to be used is absurd, aud is very similar to a case which came up on the railway with which I am connected.

A man came to the presideut with a car fender, which he was anxious to have adopted. After expatiating for some time upon its merits it finally came out that under certain conditions the fender was really good, and if a person should fall in one particular way the fender would surely save him; and he promised to send printed instructions with each fender, so that the people could be instructed to fall properly.

The conclusions one is forced to draw from the above tests and the general literature upon the subject of fuses are as follows:

1. The proper and only fuse block to be used is one having protected terminals.

2. That fuse blocks should be furnished so that the terminals would not be burned under conditions approaching an absolute short circuit across the bus bars of a 500-volt power station.

3. The magnetic cut-outs are immeasurably preferable under all circumstances.

APPENDIX.—REPORT OF UNDERWRITERS' INTERNATIONAL ELECTRIC ASSOCIATION.

Data.—The following data gives the maximum length between terminals at which arcing occurs, the minimum lengths at which no arcing was observed, and the safe lengths on 500-volt circuits for fuses, whose melting points are ideutical with the various current strengths desiguated:

Amperes.	Maximum length at which arcing occurred. Inches.	Maximum length at which no arc was observed. Inches.	Safe Lengths.
10	¼	½	1
20	½	¾	2
30	2	2	2¾
40	2	2¼	3⅜
50	2¼	2½	3½
60	3	3¼	3¾
70	3	3¼	4
80	3¼	3½	4⅛
90	3½	3¾	4⅝
100	3¾	4	4½

THE Electric Bureau of the Chicago Uuderwriters' Association has issued its fifth report, giving valuable information concerning the fires which have been the result of electric currents. It says that there are many ways in which a fire may be caused by an electric current, from a plain case of a naked wire coming in contact with combustible material to a complicated circuit. It mentions the case of a cross between the guy from the derrick coming in contact with the metal on the roof of the buildiug, a soil pipe passing up through the building and through the roof making connection with the metal of the roof. A current was conducted into the building by the guy wire, the metal roof and soil pipe, and grouuded on a water pipe, burniug a hole ten inches long, and also burning two holes iu the soil pipe, flooding the building with water but doing no other damages. In auother case reported an arc wire chafed against an iron chimney till the insulation was worn off, and the current followed down the chimney and passed to two guy wires, one of which was attached to the frame bell tower of a fire department headquarters. Arciug occurred in the tower and ignited the woodwork. The chief of the fire department was knocked down and nearly lost his life by placing his haud on the base of the metal chimney while standing on the metal roof. The accident occurred during a heavy wind and rainstorm. Crossing of wires, short circulating aud other causes resulted iu huudreds of fires from April 10th to October 10th, the time covered by the report.—Fire and Water.

THE compressed plates now in the market constituting the ordinary form of accumulators are all that is desired when both size of plate and quantity of current is available, but as regards the time required in charging the same, together with their abnormal weight, renders them altogether useless for the lecture table. To obviate this difficulty, H. N. Warren, after a lengthy research upon the subject, has succeeded in producing a small secondary cell of great delicacy that can be readily charged from a constant battery, retains double voltage and can be arranged to auy number of amperes. The small plates being arranged in pairs within a specially prepared receptacle containing dilute acid, the oxides on each plate being protected by means of indestructible tissue, rendered porous and maintaining the oxides in the paste condition, they may be readily charged for short experiments in about an hour; and which in series are capable of produciug great intensity, being manufactured at half the cost of other accumulators.

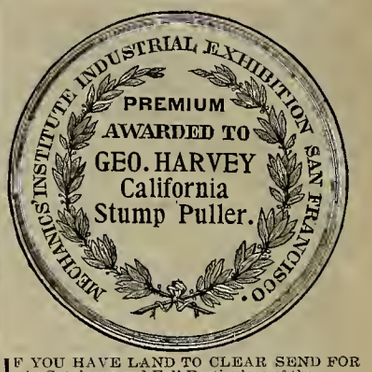
20-Stamp Mill for Sale.

In Southern California, a 20-stamp Gold Quartz Mill, with engine, boiler, self-feeders, rock-breaker, etc.

As the premises are adjacent to Railroad, the Mill could be conveniently removed. Can be had at low price for cash. Address: "Quartz Mill," care MINING AND SCIENTIFIC PRESS, San Francisco.

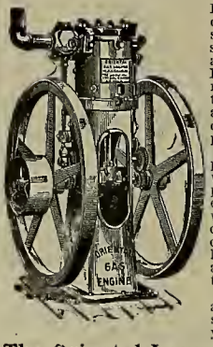
SITUATION WANTED BY ENGINEER AND machinist who understands the running and care of electric plants. Engagement preferred with parties interested in the use of electricity for the reduction of refractory ores. WM. H. RUE, 242½ 12th St., San Francisco, Cal.

GET THE BEST!



IF YOU HAVE LAND TO CLEAR SEND FOR the Catalogue and Full Particulars of the
CALIFORNIA STUMP PULLER,
28 ZOE STREET, SAN FRANCISCO. Find how cheap and easy it is to clear land.

The Oriental Gas Engine



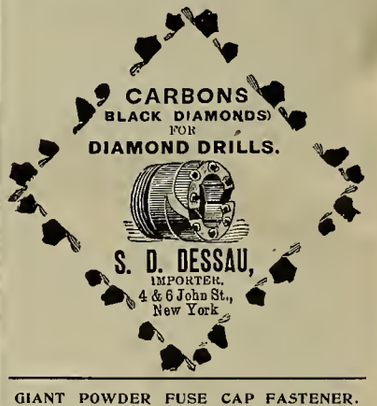
IS THE BEST because it combines simplicity of construction with power and economy of space. It can be run with natural or manufactured gas or gasoline at a cost of 20 to 25 cents per horse power per day.

It can be used for pumping purposes, as well as for all purposes where a perfect engine is required, with the advantage of lessening the risk of explosions. No licensed engineer at a high salary needed to operate it.

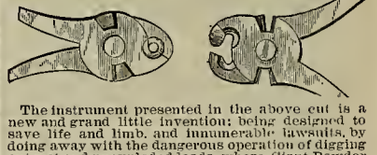
Send for circulars and prices if a good safe engine is what you need.

The Oriental Launch is Perfection.

M. A. GRAHAM,
Inventor and Manufacturer,
105 Beale Street..... .....San Francisco.



GIANT POWDER FUSE CAP FASTENER.



The instrument presented in the above cut is a new and grand little invention; being designed to save life and limb, and innumerable lawsuits, by doing away with the dangerous operation of digging out wet and unexploded loads, where Giant Powder is used in mining. The instrument is made of the finest cast steel, and crimps the cap on the end of the fuse *firmly* and *absolutely water tight*. There is also a Fuse Cutter attached. **Price 75c. each.**

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1 Latest Improved Bruckner Furnace.
2 Chlorinating Cylinders of cast iron, lead lined.
1 set Krom Rolls.
The above in use but a short time. For sale cheap. Address L. C. S., Box A.,
Mining and Scientific Press Office, S. F.

QUICKSILVER!
—FOR SALE BY—
The Eureka Company,
OF SAN FRANCISCO.
ROOM 1. - 426 CALIFORNIA STREET,
SAN FRANCISCO.

Practical Information.

Petroleum as a Lubricant.

A Chicago engineer says of petroleum that its peculiar advantages as a lubricant over all other oils are its non-oxidizable properties—that is, its freedom from gumming and acids. All other oils—animal, fish and vegetable—which were used prior to petroleum are, he continues, destructive to metals, and this destructive action is more noticeable where these oxidizable oils are used to lubricate the valves, cylinder and other internal parts of the steam engine. This destruction is accelerated by the high degree of steam heat, which causes the quick generation of stearic, margaric and oleic acids, that rapidly act on the metal surfaces, honeycombing them and eating them away. The uniform temperature where machinery is operated is a very important factor, as well as the uniform gravity and cold test of the oil to lubricate it, as is illustrated by the ordinary drop-feed lubricating cup, which is regulated by the opening or closing of an aperture near its base. It is plainly to be seen that as often as the temperature of the atmosphere changes, or the gravity or cold test of the oil is changed, so will the quantity of the oil fed through the aperture of the cup vary in furnishing the uniform quantity necessary to lubricate the machinery properly. Many expensive accidents have been caused by neglecting to observe the above.

Death is Painless.

Dr. Cyrus Edson, in *North American Review*, says: "Nothing is more common than to hear from the pulpit pictures in words of excitement, of alarm, of terror, of the death-beds of those who have not lived religious lives; yet, as a rule, if these pictures are supposed to be those of the unfortunates at the moment of death, they are utterly false. In point of fact, ninety-nine of every hundred human beings are unconscious for several hours before death comes to them. All the majesty of intellect, the tender beauty of thought, or sympathy, or charity, the very love of those for whom love has filled all waking thoughts, disappear. As a little baby just born into the world is but a little animal, so the sage, the philosopher, the hero, the statesman, he whose thoughts or deeds have writ themselves large in the history of the world, becomes but a dying animal at the last. A merciful unconsciousness sets in, as the mysterious force we call life slowly takes leave of its last citadel, the heart, and what is has become what was. This is death."

Underwear Made from Peat Fibers.

Underwear made from peat is quite extensively used in France. It has been known for some years that peat has certain antiseptic qualities. A dead body, which was buried in peat for over a century, was found in a state of perfect preservation. Peat is used in the northern countries of Europe for surgical bandages, and the favorable results obtained by the Russian surgeons with peat bandages have induced the French Army Department to use it in the French hospitals. It has also been found that peat fibers, in combination with other materials, possess wonderful absorbing properties. This has led to the use of peat fibers for the making of underwear instead of flannel. The new material has proven very effective, absorbing perspiration and rapidly drying. The inventor calls his fabric a "real hydraulic pump," and pronounces it an excellent preventive of colds.

A Wire Fly Wheel.

Among recent novel applications of wire, perhaps none has greater interest to the mechanical world than that presented by the new wire fly wheel lately erected at the Mannesmann Tube Company's Works, Germany. Heavy fly wheels driven at high velocities obviously present dangers of breaking asunder from the great centrifugal force developed. The wheel at the factory mentioned consists of a cast-iron hub or boss, to which two steel-plate discs or checks, about twenty feet in diameter, are bolted. The peripheral space between the discs is filled in with some 70 tons of No. 5 steel wire, completely wound round the hub, and the tensile resistance thus obtained is far superior to any casting. This huge fly wheel is driven at a speed of 240 revolutions per minute or a peripheral velocity of about 2.8 miles per minute, which is nearly three times the average speed of any express train in the world. The length of wire upon such a constructed fly wheel would be about 250 miles.

EXPERT naval engineers admit that "there are some things yet to be learned concerning the triple screw," but they say that its success for power and speed has been amply demonstrated. Commodore Melville claims that not only speed, but maximum fuel economy will be reached through the independent action of each screw, the center one alone being used for slow cruising. A schedule of test, made up from the performance of vessels like the Columbia and Minneapolis, has been prepared, showing the working of the triple screw.

UNITARIAN LITERATURE sent free by the Channing Auxiliary of the First Unitarian Church, cor. Geary and Franklin Sts., San Francisco. Address as above. Mention this paper. *

No. 8

...THE COMET CRUSHER OF

FRASER & CHALMERS is brought again to the FOREGROUND by the decision of the U. S. Supreme Court, May 19, 1894, concluding a long course of litigation between makers of the Gates Crusher and Fraser & Chalmers in favor of Fraser & Chalmers, and all costs and expenses to the makers of the Gates Crushers.

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MINING AND ORE TREATING MACHINERY OF EVERY DESCRIPTION.

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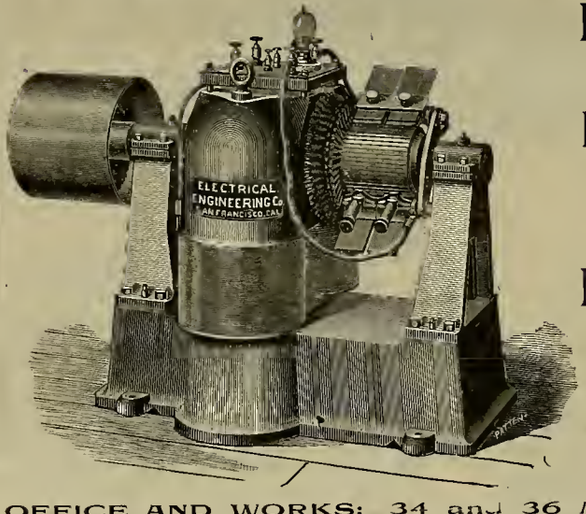

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MANUFACTURERS OF
Dynamos and Electric Motors
FOR THE TRANSMISSION AND DISTRIBUTION OF POWER.
Electric Power Apparatus
FOR
Quartz Mills, Hoisting, Pumping, Drilling,
And all Mining Work where Long Distance Transmission is required,
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Market Reports.

The Markets.

SAN FRANCISCO, Dec. 20, 1894.

During the week silver went below the 60 mark. The present quotations are mainly nominal, the market heing in a passive condition, futures depending on pending and probable legislation. The Chinese indemnity also cuts considerable figure in the case. It is understood that Japan will demand and probably secure an indemnity of $500,000,000. Both countries are on a silver hasis. There are now about $5,000,000 of free silver in the world; it is also evident that should Japan demand the payment of the indemnity in gold, such amount could not possibly he forthcoming. Wben France paid Germany the $600,000,000 indemnity in 1871, it was in gold, and upon Germany's receiving that vast amount it estahlished, practically, a gold standard in the latter country. The question is an important one and gives a silver lining to tbe present dark cloud on the interests of the white metal.

Regarding lead, an exchange says: "The agreement of all the lead corroders of the country, after a lively session of two days and two nights, is of great importance to the trade, as it means better prices for all interested and freedom from tbe friction wbich has sometimes been very decided.

"A good deal of the adverse criticism of the National Lead Company has come from outside producers who were unable to make money where the National Lead Company, with its facilities and capital, could make it. Practically all the adverse comment of the National Lead Company can he traced to these sources.

"The agreements which have been reached will firmly estahlish trade and prices on a basis better tban they have recently been in this country."

New York Prices.

NEW YORK, Dec. 20.—Following are the closing prices for the week:

	—Silver in—			
	London.	*N. Y.*	*Copper.*	*Lead.*
Friday	27⅞	61	9 50	3 00
Saturday	27⅞	60⅝	9 40	3 03
Monday	27⅝	60¼	....	.....
Tuesday	27⅞	59⅞	9 30	3 00
Wednesday	27½	60	....	.....
Thursday	27¼	60	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½
New York Telegraphic Transfer	10c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89¼
Refined Silver, per ounce	60
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6¾
Powdered, "	—	@	6¾
Concentrated, "	—	@	6¼
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Per lb	17	@	—
ZINC.			
Sheet	8¼	@	
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 25
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 25
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, bard			12 00
Wallsend			7 00
Scotob Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 65	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 37½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, bard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	— —	@	12 50
Cumberland	9 00	@	— —

Tuolumne Mining Bureau,

Sonora, Cal.

Developed and undeveloped mines for sale at lowest possible prices, for cash or bond. Correspondence and personal interviews solicited.

Assay office attached.

O. C. WILBUR & CO.

Mining Share Market.

SAN FRANCISCO, Dec. 20, 1894.

There is but little change in prices or prospects of Comstock or other stocks, the same apathy which characterized the entire year continuing to its close, the condition of the mines having little to do with the condition of the market, which has been petty throughout. Delinquent assessments have been a feature.

In California, Nevada, Arizona and South Dakota there have been 77 mines in '94 that have levied from one to four assessments, the number heing 138, aggregating $1,579,600 called for. Of these California has 29 mines, asking for $178,500; Nevada 41, with a total assessment of $1,263,600; Arizona 3, $60,000; South Dakota one, $25,000; and Mexico 3, $29,250.

The *Bulletin* reports the number of assessment mines and the amounts collected from year to year to compare as follows:

Years.	Mines.	Amount.
1883	148	$5,885,784
1884	120	4,724,700
1885	105	2,701,150
1886	86	3,024,674
1887	97	3,137,360
1888	90	3,750,300
1889	92	2,999,050
1890	89	2,392,460
1891	90	2,925,540
1892	81	2,566,320
1893	78	2,196,280
1894	75	1,543,600
Total assessment 12 years		$37,847,218

The superintendents, miners and business men of Virginia City and Gold Hill have contributed $2101 for the orphans of St. Mary's School.

The following illustrates the changes of the week:

MINES.	13	20
Alpha	.....	$ 12
Alta Consolidated	$ 21	17
Andes	38	33
Belcher	68	56
Best & Belcher	89	90
Bodie	65	68
Bullion	18	21
Challenge	39	32
Chollar	49	43
Confidence	85	.....
Consolidated California and Virginia	3 80	3 45
Consolidated New York	02	04
Crown Point	68	68
Exchequer	04	....
Gould & Curry	40	36
Hale & Norcross	.....	70
Justice	20	.....
Mexican	62	55
Ophir	1 75	1 50
Overman	.....	19
Potosi	36	31
Savage	.....	27
Sierra Nevada	.....	.....
Union	34	30
Utah	.....	07
Yellow Jacket	41	36

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 20, 1894.

9:30 A. M. SESSIONS.

400 Alpha	12	400 Crown Point	66
200 Alta	16	100 Gould & Curry	36
100 Benton	75	200 Hale & Norcross	70
300 Best & Belcher	90	100 Mexican	55
200	89	300 Occidental	07
100 Bodie	68	130 Ophir	1 50
200	67	300 Overman	19
200 Bullion	21	50 Savage	27
400 Chollar	43	700 Seg Belcher	19
100 C. C. V.	3 45	50 Utah	07
50 Con New York	04		

SECONN SESSION—2: 30 P. M.

100 Alta	17	100 Crown Point	68
100 Andes	33	150	67
800	32	500 Hale & Norcross	68
50 Belcher	56	100 L. Wash	05
100 Benton	60	100 Mono	21
200 Best & Belcher	88	500 Opbir	1 45
100 Challenge	32	100 Potosi	31
400 Chollar	41	300 Union	30
350 Con Cal & Va	3 45	100 Utah	06
5	3 40	100 Yellow Jacket	36
		200	35

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENHINO DECEMBER 11, 1894.

530,675.—DREHGING MACHINE—J. A. Ball, Grass Valley, Cal.

530,678.—HOSE SAMPLES—W. F. Bowers, S. F.

530,506.—FRUIT DRIER—J. M. Coulter, Portland, Or.

530,682.—SCAFFOLD—R. O. Davis, S. F.

530,529.—WRAPPING MACHINE—I. R. Hutchinson, Fresno, Cal.

530,708.—CAR COUPLING—J. McDonogb, S. F.

530,716.—FIRE KINDLER—F. R. Pearson, Vancouver, Wash.

530,852.—DOOR SPRING—A. D. Phelps, Galt, Cal.

530,655.—FISH LADNER—J. A. Richardson, S. F.

530,663.—FAUCET—A. C. Sbaw, S. F.

530,666.—DOOR BELL, ETC.—J. T. Stone, Oakland, Cal.

530,667.—DOOR BELL, ETC.—J. T. Stone, Oakland, Cal.

530,565.—CAR COUPLING—S. N. Wasbburn, Olympia, Wasb.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FISH LADNER.—James A. Richardson, San Francisco. No. 530,655. Dated Dec. 11, 1894.

The object of this invention is to provide a means for enahling fish to pass up over dams and other obstructions, to form resting places for them ou the way up, and to so construct the device that it is guarded from breakage by timbers and drift which may come down the stream during high water. It consists of riffles fixed transversely in a cut or channel in tbe dam or obstruction, with their upper portions at different levels and below the surface of the water so that wells or pools of quiet water are formed between the riffles, while the more rapid water flows over the top of tbe riffles without disturbing the water in the pools. In conjunction with these wells or pools there may be used an inclined imperforate apron upon which vertical cross-riffles are fixed to provide these spaces, and inclined planes or aprons so arranged with relation to the tops of the riffles as to protect them from driftwood or logs.

DOOR BELL ANN BURGLAR ALARM.—John T. Stone, Oakland, Cal. Nos. 530,666 and 530,667. Dated Dec. 11, 1894. The object of these inventions is to provide simple, cheap and easily operated mechanism wbich may be attached to doors, windows and analogous devices in sucb a manner that tbe opening of either will set the mechanism in motion and give an alarm to indicate that the door or window is being moved. In conjunction with this, in one device, is a supplemental mechanism which allows the same bell to be used as a simple door or call bell, independent of tbe automatic mechanism. It consists in the combination of a bell with a gong and hammer; an escapement by which the hammer is caused to continuously strike the gong; a pinion mounted upon the shaft of the escapement wheel; a gear engaging said pinion; a ratchet and pinion turnahle together aud a spring pawl fulcrumed upon the gear to engage the ratchet when turned in one direction, and to allow it to move freely in the opposite direction; a segmental rack engaging the pinion of the ratchet and fulcrumed at one side of the bell plate, and a diagonally arranged lever fulcrumed between its opposite ends, having one end connected with the arm of the rack and the other engaging the door jamb so that the motion of the parts is multiplied, and the movement of the door is communicated to the mechanism so as to ring the hell. By means of suitable mechanism the call may be sounded hy turning the handle without affecting the automatic mechanism, and the latter may, in turn, be operated without disturbing the bandle of the call alarm.

ADJUSTABLE BRACKET SCAFFOLD.—R. O. Davis, San Francisco. No. 530,682. Dated Dec. 11, 1894. This invention consists of a framework supporting the floor of tbe scaffolding, the outer ends of the framework being suspended by pulley blocks and ropes so that the scaffolding may be raised or lowered at will. In conjunction with this are braces so attached with relation to the scaffolding that the latter will be held level and firm and in contact with the side of the building from which it is suspended, and can, at the same time, be raised or lowered with relation to the points of suspension without losing its horizontal position or being forced away from the wall of the building.

FAUCET.—Albert C. Shaw, San Francisco. No. 530,663. Dated Dec. 11, 1894. This invention relates to a faucet and connections by which the liquid may be drawn from the cask or receptacle and the liquid can be charged with carbonic acid gas through the same device so as to keep it always in sharp condition and under suitable pressure. It consists of a faucet, a barrel having a main discharge passage and chambered extension provided with exterior threads, tbe nuts fitting said chamber, and a connection for delivery pipe having a flange in its upper end adapted to fit and be retained in contact with the chamber, and a mechanism by which gas can be introduced through a supplemental passage by means of a peculiarly constructed valve which allows the free admission of gas and prevents its return.

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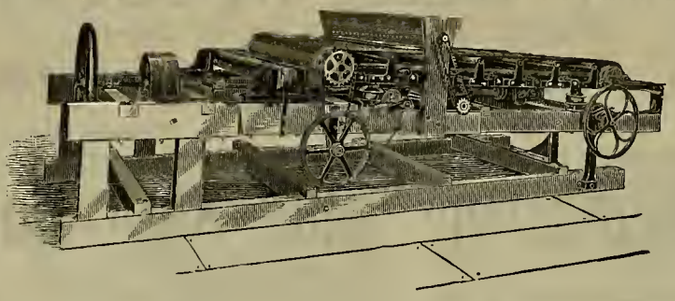

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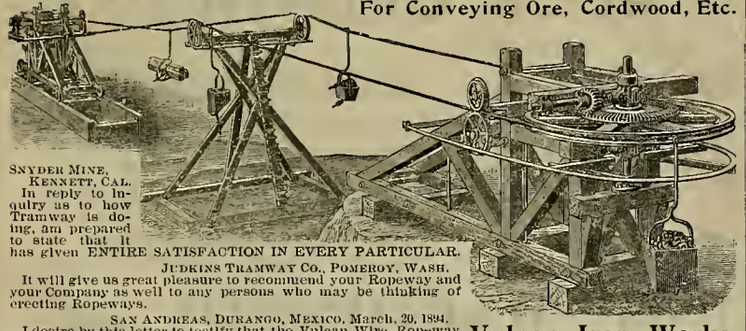

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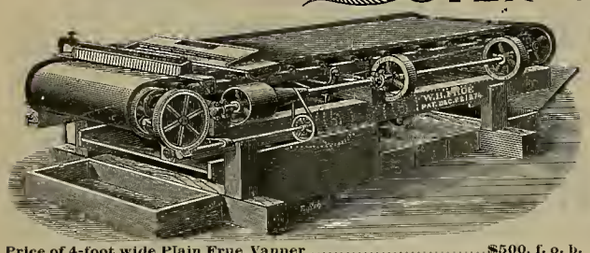

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C. J. CLARK, Gen'l Supt.

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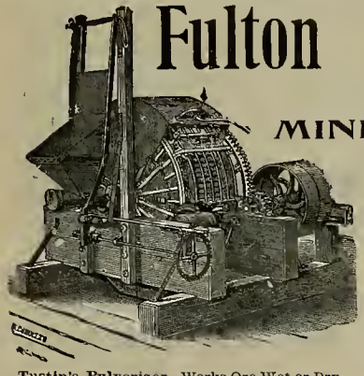

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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXIX. Number 26. | SAN FRANCISCO, SATURDAY, DECEMBER 29, 1894. | THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Best Paying Mine.

The higgest gold mine in the world is now being worked in Wall Street, New York. Originally a surface formation, it has developed into a well-extended ledge of unusual size, and is heing worked for all it is worth. No mining machinery is hought, and there are no assessments. Last month a dividend of $1,200,000 was declared on one week's operations, in addition to the regular profits. Neither the Utica of Angels nor the Kennedy of Amador can compare with the profit derived from the Wall Street mine, and the wonderful yield of the Witwatersrand is only a pocket when compared with the freest of free gold, 900 fine, that is produced in the auriferous workings of the clever Eastern syndicate. In after years, when the marvelous tales of '49 are told to unhelieving ears, it may be that the mines of '94 will he hut a myth, but at present they are a reality. Those mines are a monopoly and are protected hy the highest officials; whenever the profits are not up to the avaricious desires of the participants in the scheme, a little enlivener known as "a hond issue" makes merry the minds of the manipulators. It is not a wildcat mine, this gold discovery of Wall Street, hut it is a dishonest method of mining, and deserves suppression. Strict compliance with the national law (which in this case runs in parallel lines with common sense) would summarily end this swindling mine, which discredits the Government and those of the Government's servants who make such methods possihle.

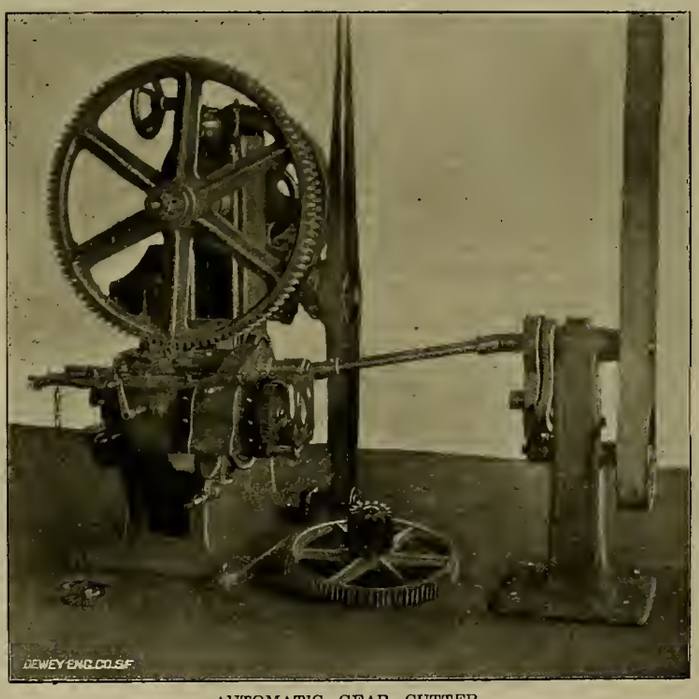
Effort is heing made in Fresno county to do the same kind of work in which so much time and money have been expended on the Feather. A large force of men is at work tweuty-five miles from Fresno, changing the channel of the San Joaquin river. It is the purpose to divert the flow of water so that the gravel near the mouth of Fine Gold river can be reached. Divers in the pool formed there have brought up many indications of great richness in gold, and the projectors, who are principally Ohio men, are sanguine of success. The present proposed work consists of a canal forty feet wide and 600 feet long to carry the water away from the present stream, leaving it dry.

The State of Washington is asking for an appropriation for a State geologic survey. The interests of the miners and the dwellers in general in that State require the formation and maintenance of a mining hureau and a systematic geologic survey, but that commonwealth needs honest officials to fairly carry out the provisions of the appropriation. This it has uot had in that department of puhlic work. Prohahly if the Washington Legislature were satisfied that the money would be honestly expended such appropriation would be forthcoming.

An unconfirmed report is traveling around that beginning with the new year miners on the Comstock will have to work for $3 per day, and that in case they will not accept the reduction the mines will close down. That has been prophesied before.

Automatic Gear Cutter.

Messrs. Van Drake and Taylor, the well known expert machinists of this city, have just added to their already well equipped establishment one of Gould & Eherhardt's gear cutters. The machine will cut spur, bevel and worm gear of any pitch, coarse or fine, up to a diameter of fifty inches. Being automatic in action, it requires but little attention beyond proper adjustment for the work in hand. The blank casting is placed in position, with a suitable cutter for gear required, and the machine does the rest, announcing the finish of the job by the stroke of a hell. A perfect gear is now removed from the machine, requiring no filing or hand work of any kind. This is the only automatic gear cutter on this coast of like capacity, and as it is intended for job work and can do the business more cheaply than by any other method, doubtless manufacturers and others having gears to cut will avail themselves of its use. The accompanying illustration shows the machine cutting a forty-eight-inch gear. It can be seen working at 523 Mission street.



AUTOMATIC GEAR CUTTER.

Seldom has any journal received a higher compliment from a higher source than a notification to this paper from the United States Committee on Awards of the World's Columbian Exposition at Chicago that it had received an award for its general excellence and reliability, and the fullness and accuracy of its reports. That is high praise and is appreciated.

The American Federation of Lahor at Denver decided against compulsory arbitration. It is hard to see how any other decision can be logically reached by any federation of labor or capital. As J. D. Weeks puts it:

> If you compel a man to work at a price he doesn't want to work at, that is slavery. If, on the other hand, you compel a man to pay wages that he doesn't want to pay, that is confiscation.

The Income Tax.

It is announced from Washington that the income tax will he enforced in '95. As incomes below $4000 annually are exempt, the new form of raising revenue will not hother the most of us very much. When called on, answers to the followiug are required:

1. Gross profits of any trade, business or vocation, wherever carried on.
2. Rents received or accrued during the year.
3. Profits from sale of real estate purchased within two years.
4. Farming operations and proceeds.
5. Money and value of all personal property acquired by gift or inheritance.
6. Premium on honds, stocks, notes and coupons.
7. Income from trade or profession not by stated salary and not heretofore enumerated.
8. From salary or compensation other than that received from the United States.
9. Undivided gains and profits of any partnership.
10. Interest received or accrued from all notes, honds or other securities.
11. Interest on bonds or coupons paid of any corporation.
12. Dividends from corporations.
13. Income of wife or minor child or children.
14. All other sources of income not above enumerated.

The deductions allowed in the return therein enumerated are:

1. Four thousand dollars exempt hy law.
2. Interest due and paid within the year.
3. National, State, county, school and municipal taxes paid, not including assessments for local henefits.
4. Amount expended in the purchase or production of live stock or produce within the year.
5. Necessary expenses, specified by items actually incurred in carrying on any business or trade.
6. Losses actually sustained during the year, specified.
7. Actual losses on sales of real estate purchased within two years.
8. Debts contracted and ascertained in the year to he worthless.
9. Salary or compensation over $4000 from which the tax of two per cent has been withheld hy dishursing officers of the United States Government.
10. Dividends included in the estimate of gross profits from corporations on which the ten per cent tax has heen paid by such corporations.

At the Union Iron Works there is now a definite prospect of completing the Oregon, which has heen awaiting the result of the controversy between the United States Government and Andrew Carnegie, regarding the structural weakness or strength of the armor plate. The claim that the plates were defective was tacitly admitted by their maker last fall, when he "compromised" with the Government by paying $140,000 fine. But the Secretary of the Navy had an interview with Mr. Carnegie last Saturday, and Mr. Herbert has accepted the plates, cracks, blowholes and all, and will prohably apologize to Mr. Carnegie who has already demanded the return of the $140,000 fine.

The Union Iron Works has nothing to do with the matter one way or the other, except to put the 420 tons of armor plate in place according to contract as instructed hy the Government. It would be more satisfactory to have positive assurance that a great battle ship like the Oregon had armor plate ahove suspicion of crack or flaw or blowholes; for in times of war the Oregon's antagonist might put those plates to a severer test than even that of the United States Government. Mr. Herhert is careful to explain that the plates when tested were cracked "by a projectile much superior to the ordinary service shot." When the Oregon goes into an engagement the enemy should be requested not to use any projectile "superior to the ordinary service shot," and thus avoid possible disaster.

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J. F. HALLORAN.....General Manager

San Francisco, December 29, 1894.

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Our Sixty-Ninth Volume.

With this issue closes the sixty-ninth volume of the MINING AND SCIENTIFIC PRESS. Thirty-four years in the life of a journal or an individual is a considerable period, the difference being that the man grows old, while the journal renews its youth, and, in fresh and active progressiveness, only points to the years of its existence as a high claim to popular favor and confidence. The next issue of this paper will be the first of its seventieth volume, the 1795th consecutive issue of the oldest journal of its class in the United States, a paper that has for nearly thirty-five years been recognized as the exponent of the legitimate mining industry on this coast and the constant expositor of all that aids in directing attention to the best industrial interests of this State and city. Technical information of all kinds, a vast number of special and valuable articles and intelligent observation on mechanical industries make a library of information not procurable elsewhere. A glance at the copious index on the last page of this issue shows the variety and value of the articles discussed in the last half year. The subject of electricity in connection with mining has been given special attention during the past year, and will continue to be given the prominence in these pages that its importance demands. The illustrations during the year speak for themselves. Anything and everything in new and improved mining appliances has been graphically depicted. General mining news of the most authentic nature has been given, and in no single instance are we cognizant of any statemeut being made that the facts did not fully warrant. The importance of this remark can best be understood by those who know the assiduity with which promoters of unworthy mining schemes seek to obtain the prestige of publicity in a paper of such standing and influence in the mining and scientific world. During all the busy years since '60 the PRESS has faithfully devoted itself to the development of the mining industries of the west half of America. It has recorded the discoveries, successes and failures, the excitements, rise and fall of many mining camps, has honestly treated all the matters under observation regarding the history and development of the great mining industry in the mineral regions of California, Nevada, Colorado, Utah, Arizona, Montana, Idaho and New Mexico, and during those years has, it is believed, formed such associations and pleasant relations with thousands of men as are given to but few journals to fortunately possess. In many things of merit the PRESS claims to be without a rival. It has seen the rise and fall of many competitors, and with belief in the theory of the "survival of the fittest," it can justly lay claim to superiority as it reviews its thirty-four years of honest and honorable existence. Whatever in its field that is novel, interesting or of value will find first and faithful mention in its columns, and the same generous meed of patronage and support accorded to it in the past will, it is hoped, be equally deserved in the future.

State Mineralogist's Address.

Following is the full text of the address delivered by Mr. J. J. Crawford, State Mineralogist, before the Convention of the Cal. State Miners' Association. Its publication was delayed for purposes of revision and accuracy, the recent accident to Mr. Crawford making such delay unavoidable:

Mr. Chairman and Gentlemen of the Convention:—I have been delegated to present a paper on mining statistics of the State. Now, as statistics are at best a dry subject, and are better adapted to be considered in the quiet of one's office or home, and, as you have been in session now three days, I will spare your feelings and quote but a few.

You all remember the allegorical fountain at the Midwinter Fair representing the State of California with the legend "California, the Land of Sunshine, Fruits and Flowers." The miners were justly indignant that the mining industry, which really created and caused the settlement of California, should not be noticed either in the legend or by a separate building on the fair grounds. Oue would not know from the literature eulogizing the resources of the State that this was a mining State at all, as mining is seldom or never mentioned. Our enthusiastic secretary has sought to rectify the error by adding the word "gold" to the above legend in the painting on this platform; but I am afraid the chief industry of this State—agriculture—would also feel offended, as the gross value of its products is greater than the mineral, horticultural and viticultural products combincd. But it had the satisfaction of having a building all to itself on the fair grouuds. It would be better to have the legend read "California, the Land of Sunshine and Flowers."

As a matter of fact, the gross value of the mineral productions for 1893, as per the following table, was $18,806,261, and a gross value of the horticultural and viticultural productions for the same year was $17,085,000, as per the table following, showing an excess in favor of the mineral productions of $1,721,261.

MINERAL PRODUCTS IN CALIFORNIA FOR 1893.

This statement, prepared by Mr. Chas. G. Yale, Statistician of the State Mining Bureau, shows the amount and value of all the mineral products of the State for the year 1893, this being based on direct returns from producers:

Antimony	50 tons.		$ 2,250 00
Asbestos	50 tons.		2,500 00
Asphaltum	9,150 tons.		161,250 00
Bituminous rock	32,006 tons.		192,036 00
Borax	7,910,563 pounds.		593,292 00
Chrome	3,319 tons.		49,785 00
Clays—			
Bricks	103,900 M.	$801,750	
Pottery uses	24,856 tons.	67,284	
			869,034 00
Coal	72,603 tons.		167,555 00
Copper	239,632 pounds.		21,571 00
Gold			14,422,811 00
Granite			531,322 00
Gypsum—			
Plaster of Paris	180 tons.	$ 3,245	
Wall plaster	240 tons.	2,640	
Fertilizer	1,200 tons.	8,400	
	1,620 tons.	$14,280	14,280 00
Insusorial earth			2,000 00
Iron ore	250 tons.		2,000 00
Lead	333 tons.		24,975 00
Limestone—			
Lime		$288,626	
Flux		12,650	
			301,276 00
Macadam rock	271,500 cubic yards.		256,875 00
Magnesite	1,093 tons.		10,950 00
Manganese	270 tons.		4,050 00
Marble			40,000 00
Mineral paints—			
Iron	30 tons.	$ 900	
Litharge	45 tons.	5,400	
Metallic	212 tons.	4,135	
Ocher	200 tons.	4,000	
Red lead	103 tons.	12,360	
	590 tons.	$26,795	26,795 00
Mineral waters	383,179 gallons.		190,667 00
Natural gas			48,500 00
Onyx			26,000 00
Paving blocks (basalt)	2,770 M.		96,950 00
Petroleum	470,179 barrels.		608,092 00
Platinum	75 ounces.		517 00
Quicksilver	30,164 flasks.		1,108,527 00
Rubble rock	99,600 tons.		199,200 00
Salt	50,500 tons.		213,000 00
Sandstone			26,314 00
Silver			537,157 00
Slate	3,000 squares.		21,000 00
Steatite	400 tons.		12,700 00
Total			$18,806,261 00

HORTICULTURAL AND VITICULTURAL PRODUCTS FOR 1893.

Citrus fruits, 400 carloads at $375	$1,500,000
Prunes, 52,000,000 lbs. at 5½c	2,860,000
Dried fruits, 45,000,000 pounds at 7c	2,750,000
Green deciduous fruits, 160,000,000 lbs. at 1c	1,600,000
Raisins, 85,000,000 lbs. at 2½c	2,175,000
Wine, 22,000,000 gallons at 15c	3,300,000
Canned fruit, 1,000,000 cases at $2	2,000,000
Miscellaneous fruit consumed at home, estimated	1,000,000
Total	$17,085,000

As I said before, the agricultural interests are greater than both of these, the gross amount being $49,750,000; and the editor of the San Francisco *Journal of Commerce* has kindly furnished me with the following table:

AGRICULTURAL PRODUCTS FOR 1893.

Wheat	$21,000,000
Barley	7,000,000
Oats, corn, etc	1,500,000
Hops	1,000,000
Beans	2,000,000
Beet sugar	1,750,000
Hay	4,000,000
Wool	4,000,000
Potatoes	1,000,000
Vegetables	5,000,000
Nuts	500,000
Miscellaneous	1,000,000
Total	$49,750,000

We believe that the State has for a number of years encouraged the farming interest more than it has the mining interest, and that the various amounts appropriated by the Legislature of 1893 is a just criterion of its policy. The biennial appropriations are as follows:

State Agricultural Society	$40,000
Citrus fairs	40,000
Forty-Third District Agricultural Societies	200,000
State Board of Horticulture	29,600
State Board of Viticulture	30,000
Commission of Public Works	30,000
Total	$369,600

And amouuting to over five per cent of the gross productions of the agricultural, horticultural and viticultural productions. The miners justly think they have not received sufficient encouragement, as only $50,000 was appropriated by the same Legislature in their interest, and that for the Mining Bureau for two years being about 2½ per cent of the gross value of mineral productions; hence the farming interest received twice as much pro rata as the mining interest. I do not make this comparison for the purpose of antagonizing the farming industry, but to simply show that the mining industry has not been fostered in proportion to its importance.

If the Legislature had been as liberal with us as with the farmer, the $250,000 appropriation under the "Ford bill" would have been made available immediately. Had the impounding dams, etc., as contemplated by the said bill, been constructed, the yield of the precious metals for '93–4 would have been materially increased over and above the amounts contained in the following tables by counties for '92–3, as prepared from the data furnished by the Director of the U. S. Mint:

GOLD AND SILVER PRODUCT OF CALIFORNIA FOR 1892.

County.	Gold.	Silver.	Total.
Amador	$1,210,383 45	$8,007 99	$1,218,391 44
Butte	316,998 50	610 00	317,608 50
Calaveras	794,531 31	24,441 32	818,972 63
Del Norte	4,102 00		4,102 00
El Dorado	198,321 54		198,321 54
Fresno	112,981 00	6 00	112,987 00
Humboldt	87,515 25		87,515 25
Inyo	13,930 31	35,995 34	49,925 65
Kern	107,738 92	72 49	107,811 41
Lassen	15,400 00		15,400 00
Los Angeles	219,204 00		219,204 00
Mariposa	81,011 94	67 14	81,079 08
Merced	445 96		445 96
Mono	396,296 85	70,006 59	466,303 44
Napa	795 69	22,893 47	23,689 16
Nevada	1,945,406 31	8,325 72	1,953,732 03
Orange	9,470 00		9,470 00
Placer	1,159,079 60	2,119 74	1,161,199 34
Plumas	432,294 62	11,730 84	444,025 46
Sacramento	124,900 00		124,900 00
Santa Barbara	896 00		896 00
San Bernardino	47,037 09	67,072 27	114,109 27
San Diego	396,517 98	2,050 75	398,568 73
San Luis Obispo	1,097 00		1,097 00
Shasta	574,832 88	7,977 29	582,810 17
Sierra	688,464 50	26 11	688,490 61
Siskiyou	1,013,731 78	56 16	1,013,787 94
Stanislaus	14,190 60		14,190 60
Trinity	1,406,603 05	168 33	1,406,771 38
Tulare	24,355 38	11 28	24,366 66
Tuolumne	1,092,549 55	911 63	1,093,461 18
Yuba	44,217 80		44,217 80
Totals	$12,571,900 57	$262,550 46	$12,834,451 03

GOLD AND SILVER PRODUCT OF CALIFORNIA FOR 1893.

County.	Gold.	Silver.	Total.
Amador	$1,505,973 98	$5,230 56	$1,511,204 54
Butte	307,350 53	5,503 56	312,854 14
Calaveras	1,669,192 95	121 80	1,669,314 75
Colusa	300 00		300 00
Del Norte	10,352 00		10,352 00
El Dorado	294,610 26	1,219 80	295,830 06
Fresno	7,118 79		7,118 79
Humboldt	66,353 61		66,353 61
Inyo	25,944 67	52,474 62	78,419 29
Kern	83,665 72	1,754 00	85,419 72
Los Angeles	14,200 00		14,200 00
Madera	150,696 55	314 24	151,010 77
Mariposa	184,146 17	297 00	184,423 17
Mono	295,057 39	11,601 11	305,038 50
Nevada	2,067,203 22	1,229 27	2,068,432 49
Placer	1,351,249 70	616 00	1,351,865 70
Plumas	362,488 05	13 50	362,501 55
Riverside	42,412 41		42,412 41
Sacramento	90,090 57		90,090 57
San Bernardino	158,060 00	447,020 00	605,020 00
San Diego	105,860 33		105,860 33
San Luis Obispo	600 00		600 00
Shasta	500,405 01	8,577 26	508,982 27
Sierra	830,343 15	45 50	830,388 65
Siskiyou	799,108 07		799,108 07
Stanislaus	150 00		150 00
Trinity	1,122,994 50		1,122,994 50
Tulare	12,818 00		12,818 00
Tuolumne	354,734 72	1,329 50	356,064 22
Yuba	30,839 27		30,839 27
Totals	$12,422,811 60	$537,157 77	$12,959,969 37

These tables show that the gold product of 1893 was $149,088.97 less than that of '92, and that the silver production of '93 was $274,607.31 more than that of '92, and the gross yield of the combined gold and silver was $125,518.34 more in 1893 than in '92.

The large increase of silver occurred in San Bernardino county, while Butte county also increased its silver production by about $5000; although its combined gold and silver product of '93 was nearly $5000 less than that of '92. In 1893 the increase and

decrease by counties of their gold and silver production is shown by the following table:

Name of County.	Increase.	Decrease.
Amador	$292,813 10	
Butte		$ 4,754 36
Calaveras	850,342 12	
Colusa		300 00
Del Norte	6,250 00	
El Dorado	97,508 53	
*Fresno		105,856 21
Humboldt		21,161 64
Inyo	28,403 60	
Kern		22,391 68
Lassen		15,400 00
Los Angeles		295,044 10
*Madera	151,010 77	
Mariposa	83,341 09	
*Merced		415 86
Mono		161,264 94
*Napa		23,689 16
Nevada	114,700 46	
Orange		9,740 00
Placer	130,996 34	
Plumas		81,523 91
Riverside	42,112 11	
Sacramento		31,809 43
Santa Barbara		896 00
San Bernardino	191,910 73	
San Diego		262,708 40
San Luis Obispo		497 00
Shasta		73,825 90
Sierra	141,898 24	
Siskiyou		214,279 87
Stanislaus		14,040 60
Trinity		323,776 88
Tulare		11,548 66
Tuolumne		737,396 96
Yuba		18,378 53

*Madera county formed from Fresno in February, 1896.
†No returns for 1893.

Under the Caminetti bill there have been some fifty odd permits granted to mine by the hydraulic method, and probably two-thirds of those granted permission are now in operation.

From the best information obtainable the production of gold in California for this year will be between thirteen and fourteen millions, and a decided increase over the production of 1893.

The oil industry is also beginning to assume considerable proportions, and during the past fifteen months some eighty wells have been bored in the city of Los Angeles upon two or three city blocks. The yield of these wells is now about 450 barrels daily and could be increased by more active pumping. About eighteen or twenty miles east of the city of Los Angeles are the Puente oil wells, which are now producing about 300 barrels per day, but which likewise could be increased should the demand warrant it. Between Newhall and Santa Paula large quantities of oil are being produced, but the amount of daily production is not now available.

Upon the request of the Chamber of Commerce of the city of Los Angeles, a representative of the State Mining Bureau is now investigating the oil formations of Los Angeles, Ventura and San Diego counties.

As a representative of the Mining Bureau, I will say that it desires to be in touch with the mining industry and to be of practical value to it. It has been deemed best to disseminate the information it gathers in connection with technical matters by means of bulletins or pamphlets, leaving the description of mines and the geological matters to be published in the report itself.

Of the bulletins we have already issued and distributed three, the first being Methods of Mine Timbering, by W. H. Storms; the second The Gas and Petroleum Yielding Formations of the Great Central Valley of California, by W. L. Watts, and the third Catalogue of Californian Fossils, by Dr. J. G. Cooper.

We have now in press a bulletin on the Cyanide Process, by Dr. A. Scheidel. It is the most exhaustive and best illustrated treatise on that subject ever written, and will be ready for distribution in about a month. This bulletin and the twelfth report will be mailed to the members of this convention who will leave their addresses with the secretary.

We have also in preparation, but not quite ready for the press, another bulletin entitled Gold Milling Practice in California. This describes the process employed in the mills in all parts of the State, and its perusal will enable the mill man in one part of the State, whose ores do not work satisfactorily, an opportunity of trying a process used in another portion of the State, whereby his ores may be beneficiated to better advantage. We also have in contemplation, by an eminent mechanical engineer, a bulletin on pumping machinery adapted to all kinds of mines and irrigation. We have also made arrangements to issue as early as possible in each year a bulletin showing the amount of all mineral products in California for the preceding year.

State Mineralogist's Report.

The twelfth report of J. J. Crawford, State Mineralogist, is issued, being the second biennial, for the two years ending Sept. 15, 1894.

The board of trustees bear testimony to the zeal, energy and fitness of Mr. Crawford and his assistants, particular and deserved mention being made of the secretary and custodian of the museum, Mr. H. S. Durden. The number of visitors registered from the date of the last report to July 31, '94, was 65,985. During that time 1038 new specimens were added.

One of the best rejoinders to those who ask "What good is the Bureau?" is found in the statement that, since the last report, answers have been sent by letter to 594 inquirers; 2070 specimens have been examined and passed upon, and 660 determinations have been made to men who have personally presented their specimens. This is but a fraction of the office work, and has nothing to do with the immense amount of intelligent information secured by field work, etc.

The "Mines and Mining Products of California" receive most extended notice. A good plan is adopted of segregating a description of the mineral products of each county in such a way as to make the volume of more than ordinary value for reference, and every mineral product of the State is given full and fair consideration. Of the 541 pages of the book, 252 are devoted to a description of the gold mines of the State, their names, their location, the names of the present owners, superintendents, etc., and other interesting matter of personal and permanent interest. The prominence of electric power in connection with mining is recognized by devoting forty-three pages to a practical illustration of "The Use of Electricity in Mining Operations." An elaborate compendium of statistics gives a correct epitome of the mineral products of the State for '93. Maps and illustrations give additional value to the volume, which throughout is deserving of commendation.

The publications of the State Mining Bureau are of recognized value the world over. In this regard it is in place to say that non-residents of the State applying for any of the Bureau's publications should remit enough in stamps to cover cost of postage. The postage on the 8th Report is 25 cents; on the 9th, 12 cents; on the 11th, 16, and on this one 16 cents. The publications of this Bureau are rightly accounted of permanent value. A set of the first ten of the Mineralogist's reports is now held at $50.

Address before the California Miners' Association

By S. B. Christy, Professor of Mining and Metallurgy, University of California, Nov. 20, 1894.

Mr. President and Miners of California: I have listened with the greatest interest and pleasure to the proceedings of this convention, and it seems to me that the keynote of all that has been said is the necessity for co-operation.

In 1776 when those brave men who drew up the Declaration of Independence had met for the last time to sign it, and the last pen stroke had been made, there was a moment of silence. John Hancock, turning to the assemblage, said: "Now, gentlemen, we must be unanimous; there must be no pulling different ways; we must all hang together." "Yes," added Benjamin Franklin, "we must all hang together, or we shall all hang separately." American history tells how nobly they hung together, and our common country is their monument.

But we Californians have not yet learned to hang together. Existence has been so easy with us that co-operation seemed unnecessary. But now, for the first time, the farmer finds no market for his wheat, the grapes hang ungathered upon the vine, the wine-press is untrodden, the forge, the cupola, and the lathe are idle and the wheels of commerce locked.

No single cause has contributed more to this result than the unfortunate conflict between the farmer in the valley and the miner in the mountains. This ill-managed contest has brought evil to the whole community. Invested millions have been rendered worthless, producing thousands have been driven from their labor, the nearest market for the valley farmer has been destroyed, and every interest of the State has suffered.

In this connection I wish to call your attention to some statistics which I have given more fully in the programme of this convention. There are only three producers of material wealth in any community—the farmer, the mechanic and the miner. All the rest of the community depend on them for their existence. According to the Tenth Census (the only one yet available), in 1880 each farmer produced a gross value of $289; each mechanic (deducting one-third for the value of the raw material) produced a value of $996, and each miner produced $1167. According to data furnished by the State Mineralogist for 1893, each California miner produced a value of $1434 as the result of his labor. Man for man the miner has created more material wealth as the result of his labor than any other member of the community.

The miner is too important a factor in our civilization to be ignored. His activity cannot be checked without throwing out of balance our whole industrial and commercial system.

Has not the time arrived for all who believe in the future of California to pull together? Is it not a common duty to bring to a peaceful issue this conflict between the farmer and the miner? A satisfactory solution of the problem is difficult. But it would be a libel on the engineering ability of our people to say that it is impossible.

For, I am firmly convinced that if this problem is attacked in the right spirit, it will be found practicable to extract the wealth of the mountains, not only without injury to the farmer, but to his lasting benefit; no longer inundating him with debris, but reclaiming the swamps and tule lands from malaria; the mountain streams will be no longer a menace to his existence, but, irrigating and fertilizing his land, they will be welcomed like the waters of the Nile, till at last the great valley of California shall support a population greater than that of ancient Egypt. And, when the last ounce of gold shall have been extracted from the mountains, the hydraulic miner will leave behind him water-power facilities that will people the mountain valleys with a manufacturing population greater than that of New England. And, relieved not only from mining debris, but also from the disturbing effects of natural detritus, the rivers of California will be maintained for all time the natural highways of commerce.

Such results as these are worth striving for, not only by the State, but by the National Government. If, in the interests of commerce, Congress is justified in improving the navigation of the Mississippi river, why should it not do as much for California? The War Department employs an able Corps of Engineers to protect the country in time of war. What better service could they render their country in time of peace than to solve such a problem as this?

Removed by their position and the traditions of their profession from the least suspicion of self-interest, their solution would be received with confidence by all classes of the community, and it would be possible to accomplish under the authority of the Government what would be impossible to any one else.

The United States Geological Survey might also be of service in this matter. This body employs trained geologists, some of whom have devoted their lives to the study of the eroding and carrying power of rivers and mountain streams. This knowledge of natural laws, based on observations all over the world, would be of great service in solving the problem which has become so important to California industries.

There is no citizen of the State or Nation, miner, farmer, merchant, manufacturer or common laborer, who is not interested in seeing the gold extracted from the Sierras without injury to any other interest. And he who, whether by the arts of the agitator and the demagogue, or by clandestine evasion of the law, renders a peaceful solution of this question more difficult is a public enemy and should be treated accordingly.

I have been invited to say a few words about the Mining Department of our University, though the lateness of the hour warns me that I must be brief. The University of California is a combination of colleges. The organic act incorporating the University, now embodied in the State Constitution, provides that "There shall be organized, in the order mentioned, a College of Agriculture, a College of Mechanics, a College of Mining, a College of Civil Engineering, a College of Letters, and such other colleges as the Board of Regents may hereafter provide." Since then Colleges of Law, Medicine and Art have been added. But those who founded the University of California founded it on the industrial idea, putting the great industrial arts, agriculture, mechanics and mining on an equality with the time-honored liberal arts of the schoolmen. Not only this, but they provided free instruction for all who are able to benefit by it.

A mining school can have no reason for its existence unless it can teach the miner something he cannot learn so well in the mines. The question arises: "Are there such things?" It seems to me there are several. In the first place, every one will admit that the miner should be able to recognize a bonanza when he finds it. There are many instances which show he is not always able to do it.

In Shasta county, not very long ago, probably some of you remember the case of the miner who struck a rich pocket of free gold, and for a long time pounded out these rich specimens in a hand-mortar, being very much annoyed by a dark shining mineral, which he threw over the dump because it would not amalgamate. Finally an old Colorado miner, who was better posted, happened along, and informed him that it was rich telluride of gold he had been throwing over the dump!

But even the Colorado miners miss a bonanza sometimes. Sluicing for gold in the so-called "California Gulch" for a long time, they were annoyed by a heavy gray mineral which choked up the sluices and would not amalgamate. It was a long time before they found out that it was carbonate of lead carrying chloride of silver, and the discovery of the rich silver-lead deposits of Leadville followed.

The Nevada miner has had the same experience. Again sluicing for gold, he was troubled by a bluish-gray mineral which would not amalgamate and was vigorously denounced as a nuisance, until a Truckee farmer took a specimen to Nevada City for assay, and the discovery of the Comstock lode followed.

These cases might be multiplied, but who can tell how many undiscovered bonanzas have been missed by the hardy prospector because the value lay hidden in an unfamiliar form? On the other hand, how many men have spent thousands of dollars prospecting for coal in lava beds, when a little geological training would have saved that waste?

There are many illustrations of the need of the power to determine the value of ores. It is not always possible to wash out a prospect in the miners' horn or pan. There is other gold than free gold which does not make a showing under this test.

Not many years ago I had occasion to ask a member of this convention for permission to investigate

the work done in reducing his ore. He owned the mine himself and thought he was extracting ninety-five per cent, and so did not think it worth while employing an assayer. To make a long story short, we found he was losing twenty-five per cent of the value up the chimney and another twenty-five was lost in the tails, and he was extracting just fifty per cent. We demonstrated this loss to his satisfaction and the mode of treatment was speedily altered.

Another case was brought to my notice by an engineering friend, where one of the largest mines in this country claimed to be extracting ninety-eight per cent, and he found they were extracting just sixty per cent. Numerous changes were made, and not long since a careful examination convinced me that they are now extracting ninety per cent.

It would be easy to multiply such instances, but is hardly necessary, for it must be admitted that a well-equipped mining school, with minerals, ores and rocks culled from a thousand mines all over the world, with laboratories for the study of chemistry, physics, assaying, metallurgy and ore-dressing, with shops for the study of mechanics and electricity, and a complete equipment of instruments for instruction in surveying, can teach the miner many things he needs to know that he cannot learn so well at the mine itself.

But there are also things that the student cannot learn at the mining school. These are the actual conditions which the miner is forced to meet—the multitudinous details that are only to be learned by actual contact with the things themselves. It is of this I particularly wish to speak, in order to secure your co-operation in making our work practically successful.

Since the last meeting of this convention a large committee of our engineering faculty spent six months, meeting twice a week, and considering every point, for the purpose of reorganizing our whole course of instruction. Every subject not fundamentally essential to the course has been eliminated. The leading idea has been to arrange all the remaining subjects so as to make them most effective. With this in view, every subject taught is illustrated from the very beginning by practical exercises in the laboratory, the drawing-room and the field. In this way only, it is believed, can he secured either that firm grasp of principles or that readiness in their application so essential to the successful engineer. In the next place the summer vacations of three months each have been utilized to secure, at the mines themselves, an introduction to the practical work which must he met after graduation.

In Europe, where the mines, as well as the mining schools, are under government control, it is a simple matter to secure facilities for such practical instruction. Here we must depend entirely for this result on your good will and co-operation. The University of California is not an institution for rich men's sons. A large majority of our students contribute, at least in part, to their support, and among them are to be found the most successful men we have. Consequently, when we attempted to introduce this new feature, involving additional expenses, many of our students were unable to meet them. Last summer two of them came to me explaining their situation, but said they were willing to work if they could thus earn their expenses. I gave them a letter to Col. Alvinza Hayward explaining the facts, and he put them at work in the Utica mine. They were paid regular miners' wages, and Supt. Lane of the Utica informed me to-day that they earned every cent they were paid, and he would be glad to have more men of the same sort. I wish to ask the co-operation of every mining man in the State to help in making this feature of our instruction a success.

And there is another thing I wish to ask of you, and that is to send us the best material—your own sons—to be educated as mining engineers, and then I am sure you will help us to make them successful. One of the great difficulties that meets the young man in the mountains is the lack of preparation necessary to enter college. To overcome this difficulty our faculty has been laboring for years to increase the number and the efficiency of our High Schools. Those whose work is found to be satisfactory are put on what is called the "approved list of High Schools." The graduates from such schools are admitted to the University without further examination, on recommendation of the principal.*

I have shown elsewhere that each mining engineer in the United States superintends and controls a production of $100,000 a year. During his working life of thirty years, this amounts to a gross output of $3,000,000 for each mining engineer in the country.

Surely it is not a bad investment for a young man to spend four, five or even more years in fitting himself for a position of such responsibility. Particularly is this true in California, where the State offers its instruction free to all who are able to benefit by it.

There is no profession where practical experience is more essential than in mining. But the necessity of sound training is too often lost sight of. A hard-headed Arizona miner once put the matter very tersely when the superiority of the "practical man" was being strongly urged, by saying: "I have had thirty years' practical experience in mining, and I would give twenty-five of those years to have had a good technical education to begin with." He was clearly right, for a man well trained in fundamentals has a broader grasp and can more intelligently and rapidly utilize his experience than a man without this training.

Either theory or practice, alone, is helpless; united they are invincible. No better instance can be given of the value of combined scientific and practical training than the wonderful development of the mines of South Africa. All the world has been astonished at the rapidity with which they have sprung into prominence, but few have reflected upon the reason of this rapid development. The miners were nearly all negroes, hardly escaped from barbarism; but the work was largely managed, almost from the first, by educated mining engineers, many of them from California.

The diamond mines at Kimberley are contained in what was once the throat of a mud volcano. It was worked at first as an open cut, till, as they got deeper, they were being continually overwhelmed by slides from the caving walls. At this time the mines were visited by Gardiner F. Williams, a graduate of the University of Californuia, who had afterwards studied in Europe and worked at drift mining in California. He soon came to the opinion that their method of mining was faulty and they could work more cheaply and safely by adopting methods similar to what he had seen in the drift mines of Californuia. His views reached the ears of the directors, who were in despair at the lack of dividends. Mr. Williams was finally made manager of this great property and soon made a practical demonstration of the correctness of his views. His company now commands the diamond market of the world.*

Mr. Heunan Jennings, a graduate of the Lawrence Scientific School, who got his practical mining experience at New Almaden, North Bloomfield and the Ruby drift mine in Californuia, is another who has largely contributed to opening up the gold mines of Johannesburg. I recently had the pleasure of looking over a large album of views in the mines in which he had been consulting engineer, and those who are familiar with our best equipped plants would be astonished to see how far South Africa has leaped ahead of what is usual in California. They have been executed by California men, as the result of California experience, and they have often improved upon their model, because they have been allowed to carry out their ideas to their legitimate conclusion.

After many previous failures, it was reserved for another graduate of the University of California—Mr. Charles Butters—to make the first working success with the chlorination process in South Africa. Having accomplished this, he erected there the first successful cyanide reduction works in the world, and I heard from him only yesterday that he was getting good results in the electrical precipitation of gold by the Siemens and Halske method.

But there is still another lesson to be learned from this South African experience, and with this I must close. Governor Markham has truly said that if any other country in the civilized world had the hydraulic mines of California, they would have found a way to allow the miner to work them. England has no gold mines of her own, but she has shown energy enough in opening those in the heart of Africa. And while Californians were busily eugaged in discouraging California miners; while the California farmer was trying hard to kill the goose that lays the golden egg, England has carefully culled from the most energetic and experienced of our miners, men like Hamilton Smith, Henry C. Perkins, Capt. Thomas Mien, and many others, and has set them to extracting what is now British instead of what might have been California gold.

In 1888 this South African product amounted to over four million dollars, and the product has steadily increased until in 1893 it amounted to nearly twenty-seven million dollars, and in the six years it has reached the sum of over eighty-one million dollars. There is an eloquence in these figures that should appeal to all Californians.

*It may be interesting to add that Mr. Williams has sent his own son to study mining at the University of California.

*As it may prove of service, the following list for 1894 of approved High Schools and academies from which graduates are admitted without examination, on recommendation of their principals, to the College of Mining is appended: Alameda, Armijo, Bakersfield, Belmont School, Berkeley, Boone's University School, Centerville, Coronado, Fresno, Grass Valley, Haywards, Healdsburg, Hoitts' Oak Grove School, Lompoc, Los Angeles, Marysville, Mt. Tamalpais Military Academy, Nevada City (in part), Oakland, Oak Mound School, Napa, Pasadena, Petaluma, Pomona, Redlands, Riverside, Sacramento, Salinas, San Bernardino Academy (in part), San Diego, San Francisco Boys' High School, San Jose, San Rafael, Santa Ana, Santa Barbara High School, Santa Barbara College, Santa Cruz, Santa Monica, Santa Rosa, Sonoma Valley Union, St. Matthews' School, Stockton, Trinity School (in part), Vallejo, Ventura, Visalia, Watsonville.

Personal.

M. D. HOWELL has succeeded E. W. Roberts as superintendent at the Carson Creek mine, Calaveras Co.

E. H. BENJAMIN, one of tbe delegates of the State Miners' Association to the Trans-Mississippi Congress, held at St. Louis, has returned.

TIREY L. FORD and Charles G. Yale of San Francisco and J. L. Fulweiler of Placer county are the appointed delegates to attend the meeting of the River and Harbor Improvement Committee, to be held in Sacramento.

Concentrates.

THE majority of the deep quartz and drift mines in Sierra Co. are run by electricity.

GOLD is reported discovered in the gravel and black sand of Russian river, near Duncan's Mills.

THE Gracie Consolidated claims at Gold Flat, Nevada Co., have been sold by G. W. Baldwin to Geo. Senn for $25,000.

ARRANGEMENTS are being made to light Angels and the mines, also the towns of Murpbys and Altaville, by electricity.

AT the Helena, Montana, assay office it is estimated that the receipts for 1894 will reach $2,000,000, as against $1,300,000 in 1893.

OVER $60,000 has been expended this summer on the Unga island, Alaska, mines, in putting in a 30-stamp mill and chlorination works.

THE Marotte mines, in Jackson Co., Or., owned by the Detroit Mining Company, of Detroit, Mich., have a ten-stamp mill upon the ground.

WIGGINS & WILSON, of Kennedy, last week shipped from there forty tons of high grade gold ore from the Hidden Treasure mine to the Selby Smelting and Lead Co.

THE Ora Dell group in southern Oregon, owned by the Ora Dell Mining Company of Chicago, are now putting up a mill on tbeir property.

THE Virtue gold mine, near Baker City, Or., employs seventy men and keeps a twenty-stamp mill going. The profit is $18,000 per month.

THE Mary Ainsworth mine, Josephine Co., Or., owned by Clough & Wright, is equipped with an arrastra. The three first sixteen tons of ore gave $526.

ABOUT 100 tons of ore from the Succor mine are being worked in the Taylor mill in Silver City, Nev.; it is expected that the cleanup will net the owners of tbe ore about $10,000.

THE report of the Administrator of British New Guinea shows considerable falling off in the export of gold from that province. Tbe output was 3850 ounces in 1888-9; it was 582 ounces in 1892-3.

THE Standard Gravel Mining Company has incorporated in tbis city with a capital of $240,000, fully subscribed. Directors—Mikal Olsen, Thomas Thomson, E. R. Knippenberg, W. E. Hargers, Henry Gerdan.

IT is becoming a question in tbe Slocan what to do with the carbonates found in many of tbe claims. They are not rich enough to ship, running about eighty ounces, but still have to be mined and taken out of the way.

UP to the passage of the silver bill the Anaconda mine was turning out silver and copper. It is now turning out gold and copper. A similar change in the complexion of other mines would be of present satisfaction to their owners.

WORK will be begun next spring near Rainbow falls, Montana, on large copper refining works. In the erection of tbese works it is the intention of the Anaconda Company to make them of sufficient capacity to treat the entire output of their mines.

JAMES MOORE has forty men at work on his property near Radersburg, Montana, the payroll amounting to about $3500 monthly. The mine is a free-milling gold-ore proposition, and it is understood that a large stamp-mill is soon to be erected to work the ores.

THE Denver *Record* declares that in Cripple Creek a prospector cannot miss it. All he has to do is to throw his hat in the air and sink a shaft where it lights. It was in just some such fashion as this that nearly all tbe big properties of tbe camp were located.

THE New Mexico Electro-Chemical Reduction Company has incorporated in Cbicago, Ill., to mine, reduce, refine and treat ores, minerals bearing gold, silver or other precious metals. Capital stock, $100,000. Promoters: Otto R. Barnett, Glenn C. Plumb, Clark Edw. Ridpath.

THE Salt Lake copper plant is in the possession of A. Hanauer by reason of the failure of the company to pay interest on $100,000. The entire debt of $227,200 fell due on last Monday. Tbe property is to be sold at sheriff's sale Jan. 14, '95. It is understood it will be bougbt in by a syndicate of creditors.

MARCUS DALY says that during the existence of the Anaconda Company it had expended $44,050,000 in the upbuilding of Montana; that in two years Great Falls would be shipping steel rails East and sheet copper to India, and while he was manager of the Anaconda Company miners' wages would not be reduced.

ON the 24th inst., the Hecla Consolidated Mining Company of Glendale, Montana, paid three dividends, Nos. 132, 133 and 134, of $15,000 each—the usual monthly dividend of 1 per cent, a Christmas present of $15,000 and a New Years gift of a like sum. This makes the total sum of cash dividends paid by this company to its stockholders $2,010,000.

WORK goes on on the big McCune drain tunnel in the Park City, Utah, mining district. A penetration has been made of 2000 feet. The entire length proposed will drain all the properties that run along the veins south of the parallel to the Ontario tunnel, including the Wasatch and McHenery mining groups. The tunnel may be almost as useful as the Ontario eventually.

A DENVER dispatch says the recent gold strikes in Leadville are causing excitement. Tbe railroads can hardly carry the people. Gold strikes have been numerous in Leadville for the past two years, but none have attracted so much attention as the two latest in the Rex and Triumph mines, which go to establish the fact that the gold belt extends at least tbree miles, the two discoveries being that far apart.

As a consequence of Government intervention an arrangement has been arrived at between the African Gold Recovery Company and those who had called in question the validity of the company's patents, consisting in judgment being entered for the company in the litigation that has been proceeding, thus establishing the validity of the cyanide patents in the South African Republic, and the company, in consideration of the term of its patents being extended for five years, agrees that the royalty for their use shall be reduced to 3½ per cent in the Transvaal. As the patents had still about eight years to run, this means that they will continue to bold good for thirteen years from now.

The Electro-Metallurgy of Gold and Silver.

Read before the Engineers' Club, of Philadelphia, by A. L. Ellonhead.

I hope the following will be of interest to some of the members of this club and to others who are interested in the utilization of electricity in the cheaper methods of extracting gold and silver from their ores.

Those who are familiar with the cyanide process know of the difficulties one contends with in using shavings or zinc in any other form to precipitate the gold and silver from cyanide solutions; such as the dissolving of the zinc as the solution passes over it, and after a short time rendering the solution inert for the dissolving of gold and silver, which makes necessary the running to waste of large quantities of solution, which contain considerable free cyanide of potassium, gold and silver.

There are certain unaccountable reactions that occur which prevent the total precipitation of the precious metals from the solution when using zinc shavings as the precipitant.

Large losses occur in collecting, drying and smelting the resultant "zinc slimes," or precipitate, which we all know is not a homogeneous mass, and great care is necessary in sampling it for assay. The resultant bullion is sold in South Africa for about ten shillings ($2.40) less per ounce than for the bullion received from the amalgamated plates of the stamp mills.

There has been erected a small plant for working what is known as the electro-chemical process (patent applied for) on the west side mine of the Tombstone Mill and Mining Company, of Tombstone, Arizona.

The process overcomes the above difficulties encountered in precipitation, in which electricity enters as a factor and the resultant precipitate is recovered in the shape of gold and silver amalgam.

Electricity is being utilized more and more every day in chemical and metallurgical operations, and it is not surprising that an important discovery has been recently made, in which it has been found that the precious metals can be precipitated on a large working basis when they are in solution with certain chemicals, such as the cyanides, with the aid of electricity for the electrolysis of certain saturated solutions of the alkaline metals or earths.

A description of the process is as follows: The ore was crushed to a certain fineness, depending on the character of the gangue. It is then placed in leaching vats, with false bottoms for filtration, the same as other leaching plants. A solution of cyanide of potassium and other chemicals of known percentage is run over the pulp and left to stand a certain number of hours, depending on the amount of metal to be extracted. It is then drained off and another charge of the same solution is used, but of less strength, which is also drained. The pulp is now washed with clean water, which leaches all the gold and silver out and leaves the tailings ready for discharge, either in cars or sluiced away by water, if it is plentiful.

The chemical reaction of cyanide of potassium with gold is as follows, according to Elsner:

$$2Au+4KCy+O+H_2O=2KAuCy_2+2KHO.$$

That is, a double cyanide of gold and potassium is formed.

All filtered solutions and washings from the leaching vats being saved and passed through a precipitating "box" of novel construction, which may consist either of glass, iron or wood, and made in any shape, either oval, round or rectangular—if the latter, it will be about ten feet long, four feet wide and one foot high—and is partitioned off into five lengthwise compartments. Under each partition, on the inside or bottom of the "box," grooves may be cut a quarter to a half inch deep, extending parallel with the partitions, to serve as a reservoir for the amalgam, and give a rolling motion to the solution as it passes along and through the four compartments. The center compartment is used to hold the lead or other suitable anode and electrolyte.

The anode is supported on a movable frame or bracket, so it may be moved either up or down as desired, it being worked by thumb screws at each end.

The electrolyte may consist of saturated solutions of soluble alkaline metals and earths. The sides or partitions of each compartment dip into the mercury, which must cover the "box" evenly on the bottom to the depth of about a half inch.

Amalgamated copper strips or disks are placed in contact with the mercury and extend above it, to allow the gold and silver solution of cyanide to come in contact.

The electrodes are connected with the dynamo; the anode of lead being positive and the cathode of mercury being negative. The dynamo is started, and a current of high amperage and low voltage is generated, generally 100 to 125 amperes, and with sufficient pressure to decompose the electrolyte between the anode and the cathode.

As the gas is generated at the anode, a commotion is created in the liquid, which brings fresh and saturated solution of electrolyte between the electrodes for electrolysis, and makes it continuous in its action.

The solution of double cyanide of gold, silver and potassium, which has been drained from the leaching vats, is passed over the mercury in the precipitating "box" when the decomposition of the electrolyte by the electric current is being accomplished, the gold and silver are set free and unite with the mercury, and are also deposited on the plates or disks of copper, forming amalgam, which is collected and made marketable by the well-known and tried methods. The above solution is regenerated with cyanide of potassium by the setting free of the metals in the passage over the "box."

In using this solution again for a fresh charge of pulp, it is reinforced to the desired percentage, or strengthened with cyanide of potassium and other chemicals, and is always in good condition for continuing the operation of dissolving.

The chemical reaction of forming cyanide of potassium in the precipitating "box" is as follows, per Elsner:

$$2K+2H_2O=2KOH+H_2$$
$$1(AuKCy_2)+H_2=2KCy+2HCy+2Au$$
$$2HCy+2KOH=2KCY+2H_2O$$

Which is explained thus: The potassium acting on the water of the solution creates nascent hydrogen and potassium hydrate; the nascent hydrogen sets free the metals (gold and silver), which are precipitated into the mercury and form amalgam, leaving hydrocyanic acid; this latter combines with the potassium hydrate of the former reaction, thus forming cyanide of potassium. There are other reactions for which I have not at present the chemical formulas.

As the solution passes over the mercury the center compartment of the "box" is moved slowly longitudinally, which spreads the mercury, the solution is agitated and comes in perfect contact with the mercury, as well as the amalgamated plates or disks of copper, insuring a perfect precipitation.

It is not always necessary to precipitate all of the gold and silver from the solution, for it is used over and over again indefinitely; but when it is required, it can be done perfectly and cheaply in a very short time.

No solution leached from the pulp, containing cyanide of potassium, gold and silver, need be run to waste, which is in itself an enormous saving over the use of zinc shavings when handling large quantities of pulp and solution.

Some of the advantages the electro-chemical process has over other cyanide processes are: Its cleanliness, quickness of action, cheapness, and large saving of cyanide of potassium by regeneration; not wasting the solutions, larger recovery of the gold and silver from the solutions; the cost of recovery less, the loss of gold, silver and cyanide of potassium reduced to a minimum; the use of caustic alkali in such quantity as may be desired, to keep the cyanide solution from being destroyed by the acidity of the pulp and also sometimes to give warmth, as a warm cyanide solution will dissolve gold and silver quicker than a cold one. These caustic alkalies do not interfere with or prevent the perfect precipitation of the metals. The bullion recovered in this process is very fine, while the zinc-precipitated bullion is only about 700 fine.

The gold and silver is dissolved and then precipitated in one operation, which we know cannot be done in the "chlorination process;" besides, the cost of plant and treatment is much less in the above-described process.

The electro-chemical process, which I have hastily sketched, will, I think, be the future cheap method of recovering fine or flour gold from our mines and waste tailing or ore dumps.

Without going into details of cost of treatment, I will state that with a plant of a capacity of handling 10,000 tons of pulp per month, the cost should not exceed $2 per ton, but that may be cheapened by labor-saving devices. There being no expensive machinery, a plant could be very cheaply erected wherever necessary.

Sir Humphrey Davy first electro-deposited the metal sodium in the year 1807, and deposited it easily into mercury, forming an amalgam by a crude though effective method. He first made a cup-shaped receptacle of moistened carbonate of soda, placed it upon a platinum plate, the cup was filled with mercury and made the cathode, and the platinum plate the anode; then, with a current of electricity from a powerful battery, the metal sodium was deposited into the mercury, thus forming an amalgam. Also, in the year 1837, in the Philosophical Transactions of the Royal Society, it is stated that Dr. Golding Bird, in 1837, decomposed, by means of a voltaic current, solutions of the chlorides of sodium, potassium and ammonium, depositing their respective metals on a negative pole of mercury, and thus obtained their amalgams.

It has been traced back to the year 1840 that Mr. John Wright dissolved gold and silver in cyanide of potassium solution successfully. A patent was taken out March 24, 1840, by Messrs. G. R. and H. Elkington, of London, who incorporated in their patent the above discovery of Mr. Wright for the use of soluble alkaline cyanides in any strength solutions required for dissolving metallic gold, silver or any other metal; also any compound of these metals in a finely divided condition, such as a chloride precipitate, etc. The use of cyanide of potassium, or any of the soluble alkaline earths, for dissolving metals, has become public property since the expiration of the above patent of Messrs. Elkington.

I call attention specially to the above facts to show that the ideas of using electricity for the making of alkaline metal amalgams, and the use of cyanide of potassium in particular for dissolving metals, were both well known years ago.

In the year 1837 electro-metallurgy was brought into prominence by the many experiments made upon the deposition of different metals, but it was not until recent years that the ideas then advanced were put into practical shape and successful operation. Modern mechanical devices and the powerful electric dynamo have made possible the rapid strides in electro-metallurgy.

In the electro-chemical process, which I have described above, the ideas of Sir Humphrey Davy and Mr. John Wright have been utilized to a certain extent in making sodium and potassium amalgams by the electric current, and the dissolving of metals with the cyanides; but the construction of the precipitating "box" used in the described process, whereby the gold and silver only may be extracted perfectly from an old plating solution of cyanide, or from a cyanide solution leached from gold and silver ores, is new.

It is well known to chemists that the silver of an old cyanide plating solution cannot be satisfactorily converted into pure chloride by adding an excess of hydrochloric acid and boiling the mixture. The precipitate so obtained is of different colors and contains foreign substances, while with the electro-chemical process the gold and silver only were precipitated, as was clearly shown by the assay of the resultant bullion, which was 990 fine. The cyanide solution tested contained large percentages of copper, lead, zinc and iron, with small percentages of manganese, carbonate of lime, etc., which were left in the solution, not being precipitated with the gold and silver. Surely, a more severe test could not have been taken for the demonstration of the advantages of the process.

It may be suggested, since the above metals were in combination, as the double cyanide with potassium and sodium, that the gold and silver are electro-negative to hydrogenium-potassium, or hydrogenium-sodium amalgams, depending on the electrolyte decomposed. Water requires about 1.5 volts to decompose it by an electric current; caustic soda requires over two volts, yet if mercury is present to absorb the sodium as it is set free and protect it from the water, we shall obtain sodium amalgam, while the water is decomposed, at the same time forming hydrogenium amalgam. These amalgams thus formed in the precipitating "box" coming into contact with the solution of the double cyanide of gold and silver, aid the setting of them (gold and silver) free; the mercury immediately absorbs them and forms the amalgam, which is easily collected, retorted and smelted into bullion. There may be other theories advanced by those more familiar with the subject, but the results obtained are more than flattering.

In examining the recovered gold and silver amalgam after a "cleanup," there were discovered through it hard lumps or nodules, some crystalline in form, having a bright metallic appearance, different from the surrounding mass. I would be pleased to know if any one can give an explanation of the formation of the above forms, as it presents a curious phenomenon.

The above process will be worked by the Electro-Chemical Reduction Company on a large scale in different gold and silver-bearing countries.

The process is not adapted to all refractory ores. Some need a previous treatment, as was the case with the ores tested from the Lucky Cuss mine, at Tombstone, Arizona. The ore contained silver, gold and about 35 per cent of manganese. By the simple process of leaching only three per cent of the bullion was recovered; but by first roasting with ten per cent of common salt, and then by the electro-chemical process, over ninety-two per cent of the bullion was extracted. Fuel is a great factor to be taken into consideration. At Tombstone wood costs, delivered, $9 per cord, which makes it out of the question to treat their low-grade manganese ores. In other localities, where gold is found in a finely divided or flour condition, the cost of working this process is the cheapest known, taking into consideration the amount of bullion recovered.

In the chlorination process, if ninety-five per cent is recovered from the concentrates, containing, say, six ounces of gold, there is lost 0.3 ounces, or six pennyweights, in the tailings. In the electro-chemical process pulp containing but 0.5 ounces gold is treated, and eighty-five per cent or more of the assay value is recovered; and there is lost about 0.075 ounces, or 1.5 pennyweights, of gold in the tailings. The advantage of the latter process is obvious, even if the cost of treatment were the same, which is not the case.

The possibilities of the electro-chemical process are unlimited, as the precipitating "box" may be used to extract gold and silver from the ores direct, or from other solutions than the above-mentioned cyanides.

Mining Industry.

Written for the Amador *Record* by A. Thurston Heyden.

Some prospectors think that they are never prospecting unless tbey are rampaging around in inaccessible wilds where, if they fonnd a ledge of solid gold a mile long, four feet wide aud reacbing to the foundations of China, it would not reimbnrse a company for the expense incurred in bnildiug a road to it. While it is necessary for a certain amount of advance work to be continually done, and while it is conceded that some prospectors are eminently qualified to spend their lives in a wilderuess, where seveuleagued boots and a pair of wings are essential to locomotion (as they are of no mortal use auywhere else), still these advance agents of the great mining drama are not the ones that profit by tbeir finds. Nor, taking the other extreme, are the antiquated specimens who persist in burrowing arouud worked-out camps financially successful. The successful prospectors are fonnd among those between the two extremes. They are the energetic, wide-awake men who go to new, or comparatively new, mining districts, either within a reasonable distance of present transportation, or so situated as to be easy of access in case of valuable strikes, and examine the ground and test the ledges thoroughly as they go, selecting the best and staying with them until they have ascertained their real value.

This thing of goiug into a district aud putting locatiou notices on everytbing iu sight, besides on a good deal, tbat is out of sight, and theu sitting around some one else's fire, to save cutting wood, and borrowing chews of tobacco while waiting for some industrious miner to strike it rich and thns make their claims valnable, or for a wealthy compauy to come along and give them a million dollars for ten cents' worth of prospecting is played out. There are too many single-hand clam diggers and double-hand potato miners gophering aronnd in the mountains uow. It makes the toe of one's boot ache to go aronnd would-be mining camps and see the pitifully sballow coyote holes—dignified by the names of shafts and tunnels—the miserable apologies for assessments which are unblnshingly sworn to, and then to find the owners of said woe-begone improvements squirting tobacco juice upon a saloon stove and prevaricating about the size and richness of their ledges and the Lost Cabiu mines, whose whereabouts are known to them alone.

Such prospectors and miuers are a detriment to every camp they infest. The Sierras have their share of them, and there is no room, eitber here or anywhere else, for that worthless breed. There are too mauy of this kiud on hand now, but there is room, aud a welcome, for every energetic, wide-awake person who will come and aid in the development of the conntry, instead of loafing around waiting for others to put money into his pocket.

The questions might be asked: "But what are the inducements to go prospecting in the Sierras?" "Have they not beeu contiuuously prospected ever since the days of '49?" "Has not everythiug of any value been taken up?"

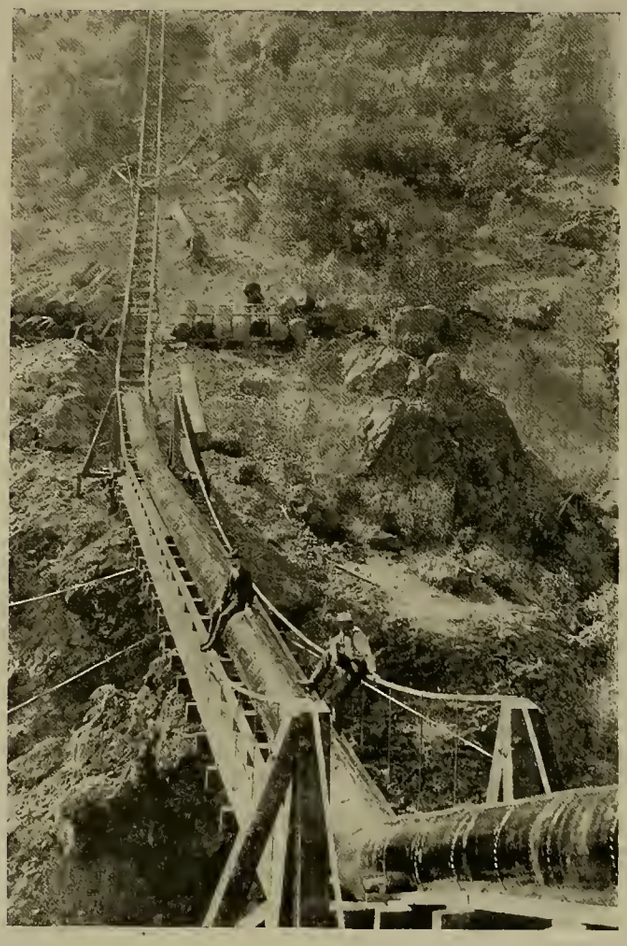
To these queries the following replies can be safely made: The inducements are mineral belts unsurpassed in mining history; accessibility, timber and water, and a large scope of practically unprospected couutry. The Sierras have been prospected ever since the days of '49, and the new strikes which are constantly being made but prove the superficial character of the prospecting which has been done. The tronble has beeu that the great mass of prospectors neither knew what they saw nor where to look. Considering the fact that mineral is found in the Sierras from 500 to 10,500 feet above sea level, and that there are millions of acres which have never had a notice of any description upon them, it is simply impossible that everything of value is taken up. Another advantage of prospecting in the Sierras is the great variety and value of their mineral resources. Building stone, precious stones, graphite, clays, silver, gold, antimony, lead and copper abound, to say nothing of placer deposits and the channels of ancicut rivers, with their rich leads of gold-bearing gravel. The eastern slope of the Sierras runs the best in silver, the western the best in gold—timber and water beiug more plentifnl upon the western slope, as well as its greater accessibility renders it the most favorable side for prospecting and operating mines.

Disguised as a Calf.

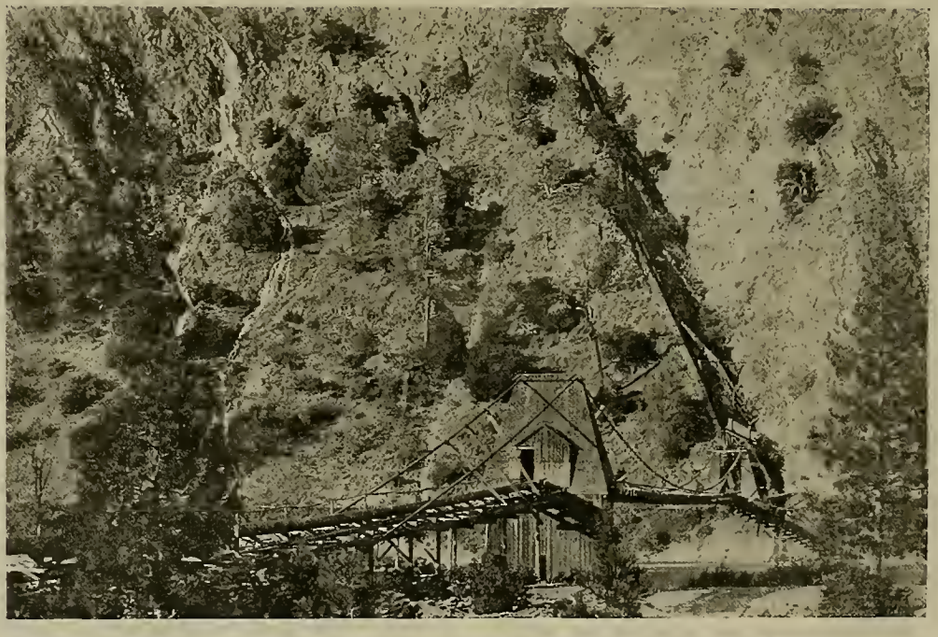
A miner operating on Sabe creek, Idaho, for some time past has missed a great deal of amalgam from his slnice-boxes. He determined to keep watch for the thief and several uights ago he saw a calf nibbling grass near the boxes, often reaching over the rim and drinkiug the water that flowed over the riffles. He, however, paid no attention to the animal. The theft of amalgam still coutinued, and a few nights ago when the calf appeared he shot it. He ran to where the calf was lying and saw a human leg with the foot wrapped in sacks protruding from the animal's stomach. It took him but a second to realize that he had shot the thief, who had been cleverly disguised as a calf. The miner took the culprit to camp, and much to his surprise he discovered the thief was a young woman.

Pipe in the Foothills.

We are in receipt of a series of illnstrations from the firm of Schaw, Ingram, Batcher & Co., of Sacramento, Cal., manufacturers of sheet steel and iron pipe, which, apart from the portrayal of tbe industry they represent, are good pictnres of Califoruia foothill scenery, tbus combining the useful and artistic in an eminent degree. The copper half-tones depict graphically the manner of overcoming natural obstacles in securing abundant flow of water in many parts of California. Yuba, Placer aud Trinity counties share in the portraiture of ways and means successfully devised to carry water across canyons, around cliffs aud up steep bluffs, and in this regard the work of tbe engraver is so well done as to leave little necessary for the pen to indite.



PIPE MADE AND LAID BY SCHWAB, INGRAM, BATCHER & CO. FOR THE BROWN'S VALLEY IRRIGATION DISTRICT, YUBA CO.



PART OF A PIPE FOR THE CIE. FSE. DES PLACERS HYDRAULIQUES IN TRINITY CO., CAL.
A portion of this pipe is being laid over a rocky bluff, 800 feet incline, and in a perpendicular rise 530 feet.

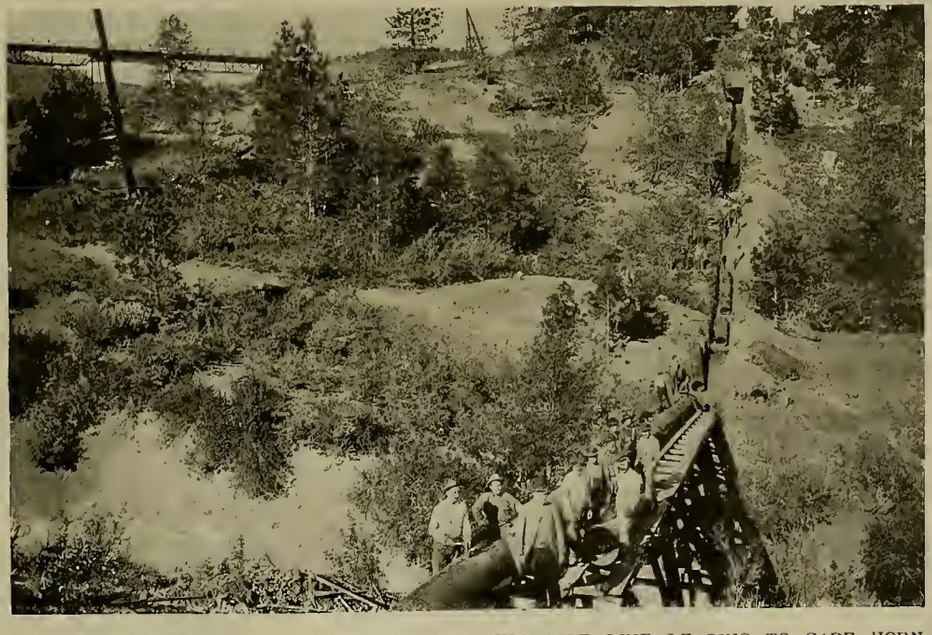
The Water Power of Niagara.

Engineers have estimated tbat the total water power of Niagara Falls is 7,000,000 H. P. This estimate, to be sure, is in the main only a guess, but when the area drained into the lakes above Lake Outario, and passing tbrough the Niagara river, be considered, the guess or estimate does not seem to be too large. The water surface of the great lakes above Ontario is 84,000 square miles, and the watershed of these lakes is 240,000 square miles—more tban twice tbe area of Great Britain and Ireland. The total length of shore line is 5000 miles, while the volume of water is 6000 cubic miles, of which Lake Superior contains almost one-half. The rate of outflow at Buffalo is from 217,000 to 275,000 cubic feet per second, while tbe fall of tbe cataract is 165 feet. The volume of water in the lakes is sueb that it bas been estimated that even if no rain fell the flow of the river would be contiuued at its present rate for 100 years—that is, if the lakes could be gradually drained. These are very large figures, says *Harper's Weekly*, but in the main they are the results of exact measurements. The small water powers in the world are uneven, and are afflicted by floods aud droughts, but tbis great power at Niagara is as constant as anythiug in this world can be, not even the ice in tbe severest and longest winter ever known appreciably cbanging it. The present plant is intended only to utilize 125,000 H. P. and the turbines now in place are only for a small part of this. Other turbiue wheels will be put in place as the demand for power grows. The general plan of the company contemplates tbe ultimate use of 450,000 H. P. on the American side and a like amount in Canada. Such a power would turn all the wheels within a radius of 500 miles of the falls. At the present time a considerable part of tbe power developed is to be taken to Buffalo by electric transmission, and it is the confident expectation of the electricians now at work on the problem that the power can be taken a far east as Albany, 300 miles away, and delivered there cheaper than power can be geuerated by burning coal. If this be so, then all the country between Albany and the falls will be admirably adapted for manufacturing, while the Erie canal will afford cbeap and tolerably quick transportation, for there seems to be little difficulty in the way of handling these boats by electrical power.

It is announced that Corn island has been leased for fifteen years, and that the lessee intends to offer it to the United States. The island is but twenty miles from the mouth of the Nicaraguan Canal.

A 125-FOOT SUSPENSION BRIDGE TO CARRY A LINE OF PIPE FOR THE BROWN'S VALLEY IRRIGATION DISTRICT, IN YUBA COUNTY, CAL.

TEAMS HAULING PIPE FROM THE RAILROAD DEPOT AT COLFAX FOR THE SOUTH YUBA WATER COMPANY.



A LINE OF THE SOUTH YUBA WATER COMPANY'S PIPE LINE LEADING TO CAPE HORN, PLACER COUNTY, CAL.

[*See Opposite Page.*]

How Coin Is Made.

For every bar which is in the vaults of the mint at Philadelphia there is a record on the books of the superintendent. That record shows the weight and fineness of the bar. Many of the bars on storage were bought in 1890, when the Sherman law went into effect. They have remained untouched from the time when the stamp of the assayer was put on them. Now they will be taken out and melted with copper, to form an alloy.

The exact proportion of silver to copper should be nine to one, but in melting a little less than the measure of copper is used, so that by adding copper later in small quantities the alloy can be made as nearly as possible of the exact standard. It is easier to work the alloy down by adding copper than it is to work it up by adding silver.

The copper and the bar silver are put in the crucible together. The crucible for melting silver is of hand-wrought iron. These pots cost $45 each. Each of them will hold about 1000 ounces at a time. Each pot is good for 250 melts. It will cost the mint about $4500 for crucibles to melt the 42,000,000 ounces of silver.

Gold is melted in a black lead pot which costs about one-tenth as much as the iron pot, but the black lead pot is good for about only thirteen melts.

No silver passes through the iron crucible. A little is absorbed by it and this is recovered when the crucible is melted after it has seen the last of its usefulness. Nothing that could yield any of the waste silver is allowed to get away from the mint without chemical treatment to extract the precious metal. The melting pots, the slag, the ashes from the furnaces, and even the outside pickings from the black linings of the furnaces are ground and sifted to obtain metallic grains, and these grains are refined.

The residue from the sieves is put into a sweep machine, which extracts the smaller particles; and the very minute particles of metal pass in the water of the sweep machine to settling vats and wells. These wells are cleaned out at very long intervals and they always yield a little gold and silver.

Gold Mines to "Boom."

A well-informed writer in the New York *Times*, December, says in reference to the failure of the London market to respond to the success of the Government loan, that it was thought "it would considerably stimulate foreign buying," but it did not. "The fact seems to be that, while there is a quite wild bull speculation running on the other side, it is almost wholly in gold mining shares, the mines of South Africa and Western Australia. Very soon they will begin to call for American gold mining properties. It is almost inevitable. The gold fever is on them, new food to feed it will be called for, and it will be found in California, Colorado, Utah and other parts of our mining regions where the development of gold fields is progressing—progressing also with such effect that the output of gold in Colorado has been doubled. It is within the probabilities that our next bull craze here may be in gold mines, for in these matters we usually join in when London has set the pace."

ADVERTISERS should be educated to appreciate that an ad in a trade paper, reaching and read weekly or monthly by the people they wish to reach, has a value to him above merely the orders it directly brings. He does not figure the value of the sign above his door merely on the basis of the patronage it happens to attract. It is there to tell everybody who passes, whether patrons or not, where his place of business is—it is a "sign" that he is in business there. So the ad in the trade journal is a "sign" year in and out, to those you wish as patrons, that you are "still in the business."

THERE is being built in a Delaware shipyard a steamboat for the United States Government which is intended for use in the waters in the vicinity of New York in the matter of preventing the dumping of ashes and other material in navigable waters of the United States. She will be 109 feet long, 22 feet beam and 12 feet depth of hold, and will have engines of considerable power. She will also be fitted with small guns to effect the obedience of the law if it is considered necessary.

THE *Century Magazine* states that "during the year now closing a quarter of a million bicycles have been sold in this country, and that the number of riders approaches a million. There are said to be over 50,000 in New York and its neighborhood, and fully that number in and about Boston."

DOLFIN SANCHEZ, a railroad magnate of Mexico, has returned from Paris and London, where he says he was successful in securing the required amount of capital for the building of an extension of the Inter-Oceanic railroad from Chietlaw to the port of Acapulco, on the Pacific coast.

THE Senate committee on public lands has authorized a favorable report on the bill providing for a commission to examine and segregate the mineral lands in Montana and Idaho within the Northern Pacific land grant.

Scientific Progress.

The Electric Problem with Reference to Fires and Firemen.

In the current number of the *American Gas Light Journal*, Prof. G. P. Lowe has a page article with the above caption, in which he says: "A most serious phase of the electrical problem is the manner in which the erection of pole lines of aerial wires interferes with the duties of firemen. The interference is dual in its nature. It is physical in that the wires present an actual barrier which must be overcome with force and it is moral in that the men are naturally fearful of the consequences of handling circuits, the character of which they do uot understand. No one need hesitate to cut telephone, telegraph or other signal wires barehandedly, for if you receive several 'surprises' they will startle you but will do no harm. No one need expect to be killed if he cuts a trolley wire or a whole set of railway feed wires. If you stand on a ladder of dry wood and which is not metal bound, and if it is not raining and you have no connection with the earth through metal or moisture, you may hack away at the trolley wire with perfect impunity and a dull ax. In fact, it alone is as harmless as the car rail, for the trolley forms one pole of the dynamo and the car rail forms the other. So long as only one is touched at the time they are without danger. But should you, by any means, through dampness or metal become connected with the earth while handling a trolley wire, you would get a 'rap' that might double you up, or it might be so light that ample solace would be had in mild profanity. Of this, however, you may feel assured; if you are robust, no shock you may receive from a trolley circuit will of itself kill. It might knock a man from a ladder and the fall might prove fatal, or if a man had heart disease he might not survive, but I have never kuown of an instance where the 'deadly trolley' has of itself proved fatal.

"With arc lighting and altcruating current wires, both of which are operated at high pressure, it becomes a matter of no little hazard for a layman to cut them, particularly if wet. It is advisable that they should be handled only by an experienced linemau. Such wires are always hot, and not only work with each other, but each with the earth.

"With reference to fires occuring in electric light and power stations and in telephone aud telegraph offices, I beg you to most carefully consider the fact that water is almost, if not quite, as fatal to most forms of electrical apparatus as is fire and that, therefore, in combating fires in such premises the utmost discretion must be used in throwing water. The necessity for this is all the greater for the reason that the stream of water may take any pressure electric current and carry it to the nozzle-men with probably fatal results."

A New Steel-Making Process.

An Indianapolis inventor, Leopold Ianke, is reported to have discovered a new process for the conversion of iron into steel. The cast or pig iron is converted, as fast as melted from the cupola, by the force of superheated steam commingled with hot and cold air, with or without ingredients, according to the quality of the metal desired. The converter is in the form of a trough and mounted on a frame to be regulated at the front end. The trough is open at the ends and top and lined on its interior surface. The bottom of this trough appears in the form of steps inclining downward to the front. At the inside coruer of each step is a small pipe, which passes through the lining and connects with the blow-pipe chamber in the bottom of the trough. The blow-pipe chamber connects with the hot and cold air injector, and in turn from the injector passes to the reheating stove and to the boiler. The hopper is attached to the top of the converter for ingredients, aud over the middle part of the converter is a hood. Some of the advantages claimed are as follows: First, the couverter can be applied to any cupola; second, it receives the molten metal directly from the cupola, thereby dispensing with all labor as required by the Bessemer and all other processes before the metal is conveyed to the converter; third, the iron is converted without the use of ponderous blowing engines; fourth, it is converted as fast as melted, thus saving the loss of heat in the iron; fifth, the iron receives all the benefit of the commingled gases and is dissiliconized and decarbonized as desired; sixth, the apparatus can be built so conform to the size and capacity of any foundry, thus enabling the smaller foundries to make steel castings at a comparatively small expense, and lastly, a saving in cost of converting of about $3 a ton.

The Auer-Welsbach Light.

Electricity. New York, has recently published two articles on the subject of the Auer-Welsbach incandescent gas light, which is viewed as a rival of the electric light. *Electricity* admits the brilliant qualities of the light, but points out some objections to its common use, chief of which are said to be the polution of the atmosphere by the monoxide gas produced, intense heat given off, etc. The same journal has also lately printed an argument in favor of the use of gas for producing electric light in isolated buildings through the medium of gas engines and dynamo machines.

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THE GERMAN SAVINGS AND LOAN SOCIETY,
526 California Street.

For the half year ending December 31, 1894, a dividend has been declared at the rate of five (5) per cent per annum on Term Deposits, and four and one-sixth (4 1-6) per cent per annum on Ordinary Deposits, payable on and after WEDNESDAY, January 2, 1895.
GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION,
532 California Street, Corner of Webb.

For the half year ending with the 31st of December, 1894, a dividend has been declared at the rate of four and eight-tenths (4 8-10) per cent per annum on Term deposits and four (4) per cent per annum on Ordinary deposits, free of taxes, payable on and after Wednesday, the 2d of January, 1895.
LOVELL WHITE, Cashier.

RUPTURE!

IT has been considered by the medical profession that hernia—commonly called rupture—was incurable, except by surgical operation, which is both dangerous to life and very rarely ever successful. But DR. J. C. ANTHONY, of 86 and 87 CHRONICLE BUILDING, has opened a new field for research, and for the past year has been making some remarkable cures. He causes the patient no pain, and those living near enough do not lose any time only while in his office once or twice weekly. He guarantees every case he treats, and does not ask a man for a dollar unless he cures him, so there can be no chance of any one being cheated. The doctor is a graduate of Bellevue Hospital Medical College, of New York City.

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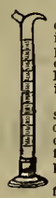

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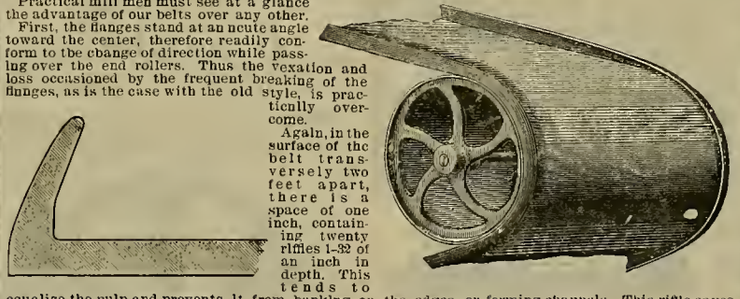

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Mechanical Progress.

Carbonic Acid Gas Gun.

In 1872 Congress gave a lump sum of $270,000 to pay for the creation of three new models of breech-loading and muzzle-loading cannon. A board of experts were appointed to attend to the business, and suggestions were invited. From all over the country were sent to Washington ideas, which were eventually published in a book by the Government. Some of them were impractical. One was for a centrifugal gun which was made to throw bullets by the turning of a wheel. The bullets were to be thrown into a hopper. Another notion was for a cannon to shoot water. This may not have been so nonsensical as it seems. Taxidermists use water cartridges to kill humming birds.

It is not safe to declare that any new idea is useless or impracticable. Recently an examiner of patents at Washington demonstrated conclusively by figures that a certain machine for which a patent was desired could not possibly work. He showed it by figures which were plain and undeniable. His surprise, then, may be imagined when the inventor brought his machine and exhibited it in actual operation, working to perfection. The notion of a gun in which carbonic acid gas is used instead of gunpowder seems absurd. Yet this invention seems likely to do wonders.

The patent was taken out not long ago in this country by Paul Giffard, a Frenchman. His idea is to compress carbonic acid gas to a liquid in a small cylinder. The cylinder may be attached to any rifle, which requires a very simple modification to adapt it for the purpose. A touch on the trigger liberates a very small quantity of the liquid carbonic acid, which instantly expands on being relieved from the pressure and drives the bullet out of the gun. Another bullet is dropped in at the breach and the operation is repeated until the cylinder is exhausted. With a single cylinder 100 bullets were fired through an inch plank at the Patent office the other day.

So long as a single drop of carbonic acid remains liquid in the cylinder, the pressure and hence the velocity imparted to the bullet is the same. A cylinder is good for 150 rounds and costs only twenty-five cents. A valve prevents the escape of more than a small quantity of carbonic acid at a time. It is expected that eventually atmospheric air compressed to a liquid will be used instead of carbonic acid gas. The pressure will then be 10,000 pounds to the square inch—more than ten times that of the carbonic acid. The velocity of the projectile will be proportionately greater. A Government could put up these cylinders in quantities, and they would be much cheaper than ordinary gunpowder cartridges. When one is used up another can be attached very quickly to the rifle.

Petroleum as a Preventive of Boiler Incrustation.

Petroleum is employed in America to prevent incrustation, and has been used for this purpose since 1875. Its value was made more fully known by comprehensive experiments at the works of the Electric Light Company in Jersey City, in 1887, and recently its use in America in this way has been extensively advocated. It must be applied in a pure state and in small quantities at a time, or it gives rise to an unpleasant smell in the boiler house. It should be allowed to enter the feed water in a uniform volume, drop by drop, in order to avoid any possible corrosion of the boiler. It is stated that the best quantity to use is from 0.8 to 1.2 pint of oil per thousand gallons of water. The action of the petroleum would appear to be that it is very rapidly dispersed in small globules through the water, and attaches itself to and dissolves the particles of lime deposited on the boiler plates. It is important that the boiler should be thoroughly scaled before the petroleum is introduced, because it attacks the existing scale, causes it to drop off, and may lead to dangerous accumulations of the deposits in the hottest parts of the boiler, and may thus entail serious superheating. It is also necessary to remember, if the oil is used to paint over the interior of the boiler, that it may lead to the production of vapors dangerous to any workman entering the same for repairs or cleansing, and the fumes may likewise cause explosions if brought in contact with a light.

As is well known, France will exercise for the fifth time what the London *Engineering* says is generally recognized as her prerogative, and in the year 1900 will hold a Universal International Exhibition after the eleven years' interval which she has fixed between each of her great exhibitions for nearly half a century. Up to the present little public interest has been aroused as to what will be a great event to usher in the new century.

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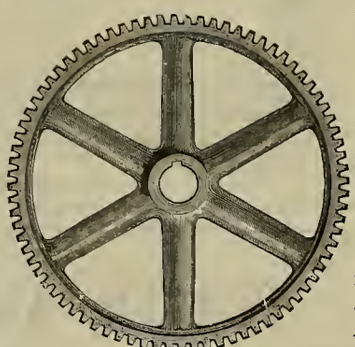

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How to Make Money in the Engine Room.

In these days of search after safe investments and every possible point of economy many manufacturers need to be reminded that the engine room is a good field for profitable investment. Of course they all believe in good engines and good boilers, or most of them do, but it is not often recognized how much there is to a steam plant besides these two main pieces.

The value of one of the minor points is brought out by *Power* in some figures which it publishes on the value of good pipe covering and the loss due to its absence.

A certain test of steam-pipe covering leads to the conclusion that it costs $15.40 to run 100 feet of naked two-inch pipe at from 70 to 80 pounds pressure for one year of 3000 working hours, with coal at $2 per ton. With the least efficient of insulating coverings used in the test this loss could be reduced to $4, with the most efficient to $2.64. Striking as are these figures, they are probably below the cost of actual practice, for a steam pipe is under pressure usually more than ten hours a day, and $2 per ton is below the average cost of coal. Prof. Charles B. Gibson, in some tests for the Manufacturers' Mutual Insurance Company, some years since, reached the conclusion that with coal at $4 per tou and 3000 working hours per year, the loss from a naked two-inch pipe was 64½ cents per linear foot—considerably more than Mr. Dickinson's test would show even with coal at $4 per ton.

As an outside cost of covering two-inch pipe with the best material may be placed at 50 cents per linear foot, these two figures given above as to annual saving—12¾ and 64½ cents per foot per aunum—show a profit on the investment of 25½ to 129 per cent. We doubt if any manufacturer can show any part of his business where a dollar is more surely or more profitably invested.

Problem In Railroading.

The big siege mortars now being put in place at Fort Point have occasioned considerable difficulty in trausportation. Even after arriving here trouble was experienced in hauling them through the city, and the commanding officer at the Presidio seemed imbued with fear that the roads there would be ruined by the transportatiou of the big dogs of war. Bringing them across the coutinent was a job. Thcy weigh 1,341,000 pounds. The mere weight was not of so much importauce, but the size of the pieces made it hard work. The ordinary railroad car is about ten feet wide, but the circles on which the motars revolvc are solid circles of cast steel, fourteen fect in diameter and two feet thick. They could not lie flat on a car, because they could not go along without jamming or knocking other cars off the track. Furthermore, there is a rule which forbids cars to be loaded higher than fourteen feet from the top of the rail. It looked at first as if it were nearly impossible. It was the Pennsylvauia road that had to do the thinking out of the scheme, for that road had the task of carrying them to Chicago. This is the way it was done:

A slot was cut in the bottom of a gondola car, such as is used for carrying coal. This was made wide enough to let in edgeways the circles which belong to each gun. Of course that weakened the car, and loug timbers had to be bolted on the floor of the car and to the cross piece in order that it would not collapse. The two circles which were to go on each car were hoisted by a steam derrick and suspended in the slot at just the right height. To tell the truth, the car was technically loaded seven inches too high, but practically there was uo violation, since the height of 14 fect 7 inches was reached at only one point in the center of the car, and no brakeman would be required to stand there. The lower rim of the axle has sufficient clearauce at the bottom—half an inch above the track level would have been enough—but about four inches was taken. The big circles were suspended at that height, while the structure that was to hold them was built of pine timbers 6x8. These were bolted with tie bolts as securely as possible.

Six cars were so arranged and the six mortars, with other gear, were loaded on ten other cars, which were not specially treated. The traiu thus carried half the load of twelve mortars on one trip. The route was on the Pennsylvania to Elizabeth over the tracks of the Central road, thence to San Francisco via the Chicago, Rock Island & Pacific, the Uniou and Central Pacific roads.

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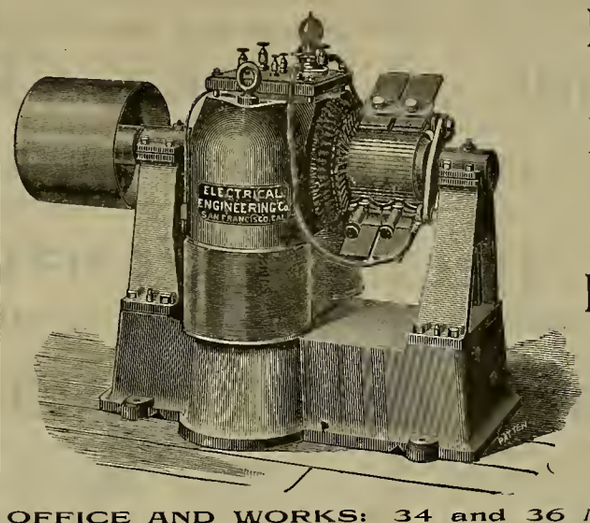

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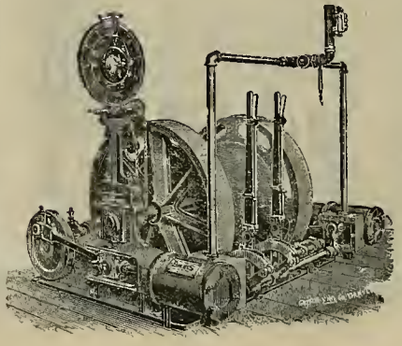

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—WITH—

Automatic Alarm Bell and Indicator.

IMPROVED GOLD STAMP MILLS.

General Mining Machinery and Supplies.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Calaveras.

Herald: Rich ore is being taken from the 260-foot level of the Blair Consolidated mine, 1¼ miles from Angels. The ten-stamp mill is running night and day.

W. A. Bisbee is putting in a four-inch pump at his mine. He recently built a five stamp mill. A tunnel has been run on the Roanoke, and the intention now is to sink a shaft from that level. This mine is in a flattering condition.

W. H. Steffler & Co. are prosecuting development work on their quartz claim at German Ridge.

At the Birney mine everything is progressing in fine shape. The mill is crushing steadily and the ore is yielding good returns. Upward of twenty men are employed, and the work of further development is being pushed ahead.

Fresno.

WORKING OLD DIGGINGS.—The hard times in nearly all avenues by which the people have been accustomed to make money have caused mining to be taken up again, where it was left off many years ago. The old Pike mine, situated at the point of Burrough mountain, three miles south of the toll house, will be worked again this winter. It is a placer mine, the gold being in the soil overlying the bedrock, and the diggings were worked and abandoned almost a generation ago.

Mono.

At the Bodie Consolidated mine during the past week they have started a drift south from the upraise from west crosscut 1, 20 feet above the 400 level, on a small seam of low-grade quartz and extended the same 10 feet. West crosscut 21 from north drift from west crosscut 1 on the 300 level, was extended 8 feet; face in porphyry. Have started a drift north from old winze from main north drift, 300 level. East crosscut from Burgess winze, 50 feet below the 200 level, was extended 7 feet. In this crosscut have passed through small seams of ore. Hoisted to the surface 7 tons of ore of usual grade—$30 per ton.

Miner: The recent cleanups at the Bodie Tunnel mill have far exceeded expectations, particularly on the Bulwer. The mill has also had rock from the Noonday and Bechtel, which has also shown up well. The break in the Stanford Company's dam has been repaired, but the cold weather cuts off the water supply. The mill has been shut down for a few days, but is now running by steam power. The cyanide people are busy melting zinc for their cleanup. They will be working at this till after the first.

Plumas.

READY FOR A RUN.—*Independent:* The Quincy M. & W. Company's reservoirs, flumes and ditches having before the coming of the late storm been enlarged and otherwise put in good order for a successful run, work is suspended until the coming of water in 1895. This company has expended a large amount of money in repairing damages wrought by the elements upon their property during the time it lay idle, under the ban of an unjust law evoked by the Anti-Debris Association. To restore this property to as good condition as it was in when injunctions from the Superior Court of Sutter county paralyzed the mining industry of Plumas, an expenditure of $40,000 was required: repairs on the water ditches alone involving the purchase of over 100,000 feet of lumber. This, however, is but bagatelle to the expense of repairing tunnels through which the ditches passed on their way from the lake and other sources of water supply to the place of use. Not this alone, but in some instances new tunnels had to be driven, where those formerly in use had fallen in beyond repair. The property is now in good condition and will remain so for many years to come. We wish we could from our heart, earnestly say: God bless the Anti-Debris Association.

Santa Clara.

A NOVEL ENTERPRISE.—Carbonic acid gas—the "choke-damp" of coal miners—in an abandoned drift in a quicksilver mine at New Almaden, Santa Clara county, is being utilized. The drift was bulkheaded to prevent the escape of the gas, which is tapped by means of a pipe taken down the shaft. The gas is drawn from the pipe and forced into a large reservoir, from which portable steel cylinders are charged under a pressure of 1300 pounds to the square inch. The gas is used in soda water, and costs much less than if made in the usual way from sulphuric acid and marble dust.

Sierra.

PROSPEROUS ALLEGHANY.—*Union:* The quartz mines at Alleghany, Sierra county, are being thoroughly developed by San Francisco and Eastern capitalists, and there will be more mills erected next year, which will make that growing mining camp one of the most prosperous, as it is used to be in the early fifties, when Alleghany and Sierra City were connected by a two miles tunnel, and gold was being daily taken out by the pound from the adjacent numerous rich gravel channel and quartz ledges.

THE BALD MOUNTAIN EXTENSION.—The Bald Mountain Extension drift mine, near Forest City, Sierra county, is being successfully operated through a tunnel a mile and a quarter long by an electric plant, and regular handsome monthly dividends will soon be coming to the persistent and lucky stockholders. The aggregate yield of this valuable mining property has been more than a quarter of a million dollars. Sufficient good paying gravel is in sight to last at least a year, besides an indefinite amount undeveloped.

ALASKA.

SEVEN DOLLARS TO THE PAN.—The steamer Chilkat from Alaska brings news of gold discovery at Cook's Inlet August 10th by a party of miners arriving recently on a schooner from San Francisco. Bedrock yielded in a crude experiment $7 to the pan of dirt while nuggets worth $20 were found in profusion. C. Beatty, one of the party, reported the find in Juneau while on his way back to this city, where he will secure the latest improved appliances for obtaining gold. Thirty feet from where the first discovery was made gravel from the projecting bluff was washed and $15 in gold taken out pan after pan. The party at once filed claims to the land and several miners have gone from Juneau to the scene.

ARIZONA.

Yuma Times: A Dodge crusher and a gasoline engine were shipped for Ehrenberg yesterday on the steamer, for the Saguaro Mining Co. Hamilton Gray and two machinists went to put the machinery in place. The company is located thirty miles northeast of Ehrenberg on a cement proposition. The capacity of the crusher is twenty tons per day, the pulverized dirt being run through a dry washer. If the trial is a success large wet process works will be built.

Journal: A. Falco, head of the Gladiator Mining company, has taken a lease on the old Peck mine, and will start operations March 1st. The old workings will be cleaned out and all necessary machinery and paraphernalia put in place for working this famous property on a large scale. This mine is located about thirty miles from Prescott and eighteen years ago gave employment to hundreds of men, at which time ore was taken from the mine running from $600 to $2000 per ton silver. Litigation stopped workings and water and ruin took possession.

BRITISH COLUMBIA.

NORTHERN BELL PAYING.—The Northern Bell mine, of Jackson Basin, Kaslo district, is again on a paying basis. This mine paid fairly well up to the first of last January, when the owner turned it over to an incorporated company of $25,000 capitalization. A broker's clerk who was sent up from Puget sound to manage the property had a $7000 debt against it in less than three months, and quite a quantity of ore shipped, much of which scarcely paid transportation and reduction expenses on account of not being properly assorted. The past fall the former owner again took charge—result, on a paying basis in a short time. Such is the difference between experience and inexperience in the great industry of mining.

COLORADO.

OVER EIGHT MILLIONS.—The Leadville *Herald-Democrat*, containing a review of the work of the mines for the past year, gives the total output of the camp for 1894 as $8,160,074. If silver had been at its coinage value the output would have amounted to $13,000,000. Of the 1894 output, the production of gold amounted to $1,934,240. This, says the *Herald-Democrat*, is certainly an excellent record for a gold camp but a year old and with but three gold properties practically producing at this time. The gold output for 1893 was only a little over $803,000.

The tonnage of the camp for 1894 as given is 362,907 tons, which is an increase over 1893, when there were but 340,000 tons of ore brought to the surface. The great Smith-Moffat group, including the Maid of Erin and Gray Eagle Consolidated, has taken out 10,000 tons more than last year, and many of the other older properties show a like increase. The grand total of the yield of Leadville mines from 1879 to 1894, inclusive, is $196,449,447.29. The number of men engaged in mining, hauling and smelting ore, as furnished by the superintendents of the different mines, is divided as follows: Miners and mine laborers, 2231; smelter hands, 650; ore haulers, 150.

OREGON.

CHLORINATION A SUCCESS.—*Democrat:* W. J. Brooks, in charge of the mill and chlorination plant at the Baisley-Elkhorn mine, Baker Co., says, concerning the success of the treatment of Baisley-Elkhorn ores by chlorination, a process but recently introduced at this mine, that wonderful success had been attained. By this treatment he was saving 98¼ per cent of the metal and assays of the tailings showed that not more than $1 to the ton was being lost. This result will surprise mining men generally.

MINING DEVELOPMENTS.—The Myrtle Point Mining Company own an interest on the same lead that the Divelbiss and Salmon mountain companies are prospecting and working, and they are making openings at various croppings, and laying aside rock or ore from each development which they will have assayed and tested when they stop work for the winter. The Divelbiss mill will start up again as soon as the mill company who own the mine get their differences settled. The Salmon mountain company have found very promising ore, and will erect a mill on their property in the early spring.

MEXICO.

The *Tráfico* says that there have been discovered some very rich mines at Batuc in the district of Ures; one gambusino took out $9,000 in a month.

It is said one of the veins crossed the public road, and had been passed thousands of times, but nobody took the trouble to assay it till the other day, as it did not look as if it was worth anything till somebody assayed it out of curiosity and found it rich. There is now quite a big traffic between Torres and Batuc. Some of the fortunate owners of the new mines were lately in Guaymas and spent over $40,000 in supplies, etc.

The Amarillas mine at Minas Prietas is still in bonanza and showing up tremendously rich.

Some of the prospects in the Altar and Magdalena districts are also showing up very well.

There are quite a number of Americans mining men and other foreigners in Sonora and the *Tráfico* prophesies a mining boom.

The agricultural interests are also very prosperous, and the rivers Yaqui and Mayo are slowly developing into rich agricultural districts.

IDAHO.

CO-OPERATION NOT A SUCCESS.—The Morning mine at Mullan has closed down indefinitely, throwing out of employment over 100 men. Manager Huntley made a vigorous effort to make the co-operative plan of running a success, but failed signally to accomplish the desired result.

The Miners' union objected to the co-operative plan and appointed a committee to confer with Manager Huntley. As lessee he told the committee he could not personally afford to pay $3.50 per day with lead and silver at the present prices and he would shut down. The co-operative plan was more like contract work, and men did more for the same money. As manager he told the men he must consult the directors of the company, but from their many letters in the past few months he thought they would rather shut down than pay $3.50, for the mine never had made anything when paying that in the past. He had no objection to the men employing an expert bookkeeper, and as soon as the month's accounts were settled and returns made by the sampler for the last few cars of concentrates, they could send the expert. He thought the November accounts would be settled in time for pay-day, to-day, and he suggested that the men go back to work until that date. But the men did not go back. All day Saturday the company's office was crowded by men getting their time, and as a result the Morning mine is closed down for an indefinite period.

The Standard mine has also closed down, throwing forty men out of employment. The shut-down will doubtless last all winter. The working force from now on will be six men, who will be employed in running the lower tunnel. This also closes the Union mill at this point, which has been concentrating the Standard ore alone. Meanwhile some necessary improvements, an ore bin and other facilities for handling the ore from the lower tunnel, will be made as occasion permits.

At the present time there is no mine in the Coeur d'Alene on which so much money is being expended for improvements as the Frisco. Extensive preparations have been under way for some time for sinking from the present level in order to keep the development work well ahead of the stoping. The Frisco mine is turning out 12,000 tons of ore per month, every pound of which is weighed before concentration. There are 150 men employed in the mine and mill. A great convenience which has just been added by Manager McDonald is a telephone line running from the station to the mill. A new power house for the Pelton water wheels is also a recent improvement which has been made at considerable expense. There is no indication that the property will close down during the winter.

UTAH.

ALUMINUM.—*Tribune:* Colonel George A. Henry has returned from an extended prospecting trip through the southern portion of the Territory, and reports some remarkable finds in aluminum. It is not remarkable that aluminum should be found in any part of Utah, as aluminum clays are present in a great many sections. The discovery of Colonel Henry is not a clay, but is aluminum in the slag. That is, it lies in a deposit of volcanic matter, and nature's crucible seems to have already brought it to a condition that in manufacturing the article is only reached after three processes have been gone through. The discovery is a remarkable and important one, and conveys the hope that aluminum can be produced for a figure considerably lower than the present cost.

Samples of this deposit, of which Colonel Henry says there is an unlimited supply in sight, have been sent to the best chemists and assayers in Europe and America for tests, and some of these tests have yielded thirty-five per cent aluminum.

The discovery was made about seventy-five miles from the Detroit mining district, and in the same vicinity large deposits of coarse and fine pumice stone were found. This is also an important discovery, as nearly all the pumice stone used in the arts and manufactures is imported from Europe. Colonel Henry states that the world's supply of pumice could be taken from this deposit for many years, and no limit found to it.

Coast Industrial Notes.

—The Paraffine Paint Co. pays a 25-cent dividend to-day.

—The German Savings and Loan Society has declared a five per cent per annum dividend.

—Beginning with January 1st, the Edison Light & Power Co. announces a cut of 10% on all bills for electric lighting.

—The Simonds Saw Company has fitted out the new saw mills at Harrisburg, and at Wilbur, Or., with their inserted tooth saws.

—One and one-half million dollars is reported to have been secured for the prosecution of the railroad work near Myrtle Point, Oregon.

—The Great Northern has contracted with the Skagit Coal and Transportation Co. for 5,000 tons of Skagit county, Wash., coal per month.

—D. B. Hauson, western representative of the Edw. P. Allis Co., of Milwaukee, has sold an Allis Band Mill to the Gray's Harbor Commercial Company at Cosmopolis, Wash.

—The past twelve months made a meager year in the annals of railroad building. The total new mileage was 1919.13. Of this, Arizona contributed 193.49, and California 32.2.

—The Pacific Coast Lumber Company and the Puget Sound Shingle Company, of Tacoma, are in the hands of a receiver. The liabilities of the former will reach nearly $35,000 and the latter about $12,000.

—A Salt Lake syndicate has paid $50,000 for what is known as the "Porphyry Dyke," situated on the west side of the Klamath river, about five miles from Hornbrook, and will soon erect a large plant—a one-hundred stamp mill, it is reported.

—At the Blue Gravel mine, an ancient river system on the Klamath, 2½ miles from Hornbrook, carpenters are framing and men excavating for a ten-stamp mill, but are building with the anticipation of adding sixty or eighty stamps more, as the company own a large area of this cemented channel.

—The proposed new system of water works for Astoria, Or., will cost when completed the sum of $200,000. It will have a gravity system of eighteen inch pipe, twelve miles long, a 6,000,000 gallon reservoir, a masonry lined tunnel 1,200 feet long, an aerating foundation seventy-five feet in height, and discharging 2800 gallons a minute; also a power plant driving a dynamo for public lighting. The power is developed by the fall of the gravity system of over 600 feet.

—A big irrigation scheme in southern California is known as the Columbian Colonization Company, with a capital stock of $4,000,000. J. G. Foster, representing foreign capital, is in San Bernardino perfecting some of the minor details preliminary to beginning work on the construction of a dam at Victor, which will impound sufficient water to irrigate 350,000 acres of land. The Santa Fe road passes through the land, and the whole can be brought under cultivation at comparatively little cost. The parties interested are the principal owners of the Bear Valley Irrigation Company.

—The Elsinore Coal and Clay Co. have a great tunnel in the side of a small mountain, which is 1400 feet long. There is a six-foot vein of workable coal without any partings. There are twelve rooms in the mine now being worked. The total force employed is twenty-five men. The production is fifty tons per day, valued at from $2.50 to $3.00 per ton at the mine. The total production of the mine thus far is about 25,000 tons. The coal is a brown lignite of fair quality and is used very largely in stationary engines throughout Southern California.

—Jas. S. Brownell, western agent Frue Vanning Machine Company, reports the following sales: Imperial mine, Kennedy, Nev., four 6-ft. Frue Vanners; Grand Victory mine, El Dorado County, eight 4-ft. plain belt vanners; Gund Gold Mining Company, Toledo, O., six improved vanners; Elder mine, Candelaria, Nev., two 4-ft. plain belt vanners; East Mayflower Gold Company, Amador county, Cal., one 4-ft plain vanner; Bay State mine, Plymouth, Amador county, four 4-ft. plain belt Frue Vanners; Original Gold Quartz Mining Company, Shasta county, four 4-ft. plain belt vanners; Sierra county, Cal., one 6-ft. plain belt and one improved 4-ft. vanner; Portland, Or., 4-ft. plain belt vanner.

—The Pacific Northwest can now boast of having the longest telephone line in the world. The Sunset Telephone company has put in operation a system of lines throughout the lower Sound country as far as the mouth of the Fraser river, reaching from Seattle to New Westminster, Vancouver, points on the Fraser river as far as Ladner's Landing, Blaine, Anacortes, Fairhaven, LaConner, Marysville and intermediate points. This completes a continuous line about 1,300 miles long, beginning at Moscow, Idaho, running thence through Spokane, eastern Washington, eastern Oregon, along the Columbia river to Portland, thence through western Washington and down Puget Sound to Ladner's Landing.

—The San Francisco and Los Angeles Railroad has been incorporated again. The incorporators are: Frederick Homer, W. H. C. Fowler, W. H. Martin, W. J. Behan and A. Judson. The road is designed to run through Alameda, Contra Costa, San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kern and Los Angeles counties, and will be about 500 miles in length. The capital stock is placed at $20,000,000 and $500,000 of that amount has been subscribed, ten per cent of which has been paid into the hands of the treasurer of the company, A. Judson. Mr. Homer, who has had charge of the enterprise from the start, takes $450,000 of the stock as trustee, and says that he represents Eastern capitalists who are behind the enterprise.

—Work is being rapidly pushed on the Santa Fe, Prescott & Phœnix road to Phœnix, Ariz., and it is expected to reach that point with the track by Feb. 1. Tracklaying was completed to the Hassayampi river south of Vulture Dec. 19, and the rails are being put down at the rate of over a mile a day. The grading is completed from Phœnix north seventeen miles and several miles remain to be graded. The future plans of the company include the extension of the line about 200 miles from Phœnix southeast via Florence, Tucson and Calabasas to Nogales to a connection with the Sonora railway. There will probably be built next year a branch from Congress switch west three miles to the mine of the Congress Gold company. The Vulture Mining company also proposes to build a line twelve to fifteen miles long from Vulture west to the Vulture mine, which will be a feeder to the Santa Fe Prescott & Phœnix. The road is now in operation from Ash Fork south to Martinez, 119 miles, of which all but sixty miles from Ash Fork to Prescott has been built this year. The entire line from Ash Fork to Phœnix will be 197 miles long.

Market Reports.

The Markets.

SAN FRANCISCO, Dec. 27, 1894.

Silver centers at 60, the fluctuations being slight. The whole course of the metal during the year has been downward. Twelve months ago the ruling quotation was 70. Silver mining in most instances is unprofitable even at that figure. The output has dropped from 60,000,000 ounces in '93 to 40,000,000 in '94, and unless a better average price is obtainable it is probable the silver yield in '95 will be less than 30,000,000 ounces.

According to the report of the Director of the Mint there is more money in the world than ever before. There are $3,965,900,000 in gold, $4,055,700,000 in silver, and $2,570,900,000 in uncovered paper money in present circulation. Since the publication of the last annual report there has been an increase of about $64,000,000 in the available stocks of gold money, and of about $124,000,000 in silver money, while the amount of uncovered paper money in circulation has been reduced.

The circulation per capita shows the United States well up in the list. The countries having the largest circulation are: France, $36.70; Belgium, $25.98; Netherlands, $25.68; Portugal, $25.36; the United States, $25.07; Australia, $23.36; and Greece, $20.68. The per capita circulation of the United Kingdom of Great Britain and Ireland is $19.98, and of Germany $18.78. In Bulgaria the people get along with less money per inhabitant than in any other country, eighteen cents in gold and $1.58 in silver being the figures.

The United States has in circulation $626,600,000 in gold, $625,300,000 in silver, and $475,700,000 in uncovered paper. The aggregate in this country exceeds that in any other.

New York Prices.

NEW YORK, Dec. 27.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	27½	60	9 50	3 00
Saturday	27½	59¾	9 40	3 03
Monday	27⅜	59⅞	....	.....
Tuesday	....	....	....	.....
Wednesday	27½	60	....	.....
Thursday	27¼	59¼	....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	7
New York Sight Draft	7½
New York Telegraphic Transfer	10c
London Bankers' 60 days	$4.88
London Merchants	$4.86
London Sight Bankers	$4.89
Refined Silver, per ounce	59¾
Mexican Dollars, nominal	50½@51

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
BORAX.			
Refined, in car lots	—	@	6⅝
Powdered, "	—	@	6⅝
Concentrated, "	—	@	6¾
COPPER.			
Bolt	20	@	—
Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	13	@	14
TIN PLATE.			
Per bx	5 25	@	5 50
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	16	@	18
PIG TIN.			
Per lb	17	@	—
LEAD.			
Pig	—	@	3 95
Bar	—	@	4 25
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 25
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Cbilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	37 00	@	— —
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 7 50
Greta			7 50
Nanaimo			6 25
Gilman			5 75
Seattle			6 00
Coos Bay			5 50
Cannel			8 00
Egg, hard			12 00
Wallsend			7 00
Scotob Splint			8 00
Brymbo			7 50
West Hartley			8 50
TO ARRIVE—PER TON.			
Australian	5 65	@	— —
Liverpool Steam	6 25	@	— —
Scotch Splint	6 62½	@	— —
Cardiff	6 37½	@	— —
Lehigh Lump	8 50	@	— —
Cumberland	8 50	@	— —
Egg, hard	9 00	@	— —
West Hartley	7 00	@	— —
COKE.			
English, to load	9 00	@	9 50
" spot, in bulk	— —	@	11 50
" in sacks	—	@	12 50
Cumberland	9 00	@	— —

THE case of the Consolidated Wyoming G. M. Co. vs. the Champion M. Co., in Nevada county, which with the decisions received full mention in this paper at the time the decisions were rendered, has been finally settled by the payment of the latter company of $77,500, thus buying the property of the Wyoming Co. This was a compromise, and was looked upon as a better settlement of all legal complications between the two companies than another protracted contest in appellate courts.

Mining Share Market.

SAN FRANCISCO, Dec. 27, 1894.

The closing week of the year has brought no change on the street. Through '94 there has been more activity in the workings of the mines than in the workings of the stocks; and when the fact is taken in considcration that the paying mines are not listed, nor their stock for sale, the contrast is still more manifest.

The following illustrates the changes of the week:

MINES.	20	27
Alpha	$ 12	.....
Alta Consolidated	17	$ 24
Andes	33	36
Belcher	56	.....
Best & Belcher	90	96
Bodie	68	66
Bullion	21	.....
Challenge	32	37
Chollar	43	40
Confidence	.....	.....
Consolidated California and Virginia	3 45	3 70
Consolidated New York	04	.....
Crown Point	68	73
Exchequer	.....	.....
Gould & Curry	36	43
Hale & Norcross	70	90
Justice	.....	22
Mexican	55	64
Opbir	1 50	1 60
Overman	19	21
Potosi	31	33
Savage	27	32
Sierra Nevada	.....	51
Union	30	54
Utah	07	.....
Yellow Jacket	36	40

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 27, 1894.

9:30 A. M. SESSION.

700 Alta	24	100 Justice	43
100	23	100 Justice	22
250 Andes	36	500 Mexican	64
200 Best & Belcher	95	100 Mono	20
100	96	200 Opbir	1 60
100 Bodie	65	100 Overman	20
350 Con Cal & Va	3 70	500 Savage	32
100 Challenge	36	200 Seg Belcher	19
100	37	100 Union	54
200 Gould & Curry	42	600 Yellow Jacket	40

SECOND SESSION—2:30 P. M.

500 Alta	22	600 Overman	20
50 Bodie	66	300	21
350 Best & Belcher	95	200 Potosi	33
100 C. C. V	3 60	50 Opbir	1 55
100	3 65	300	1 60
50 Chollar	40	200 Savage	29
350 Crown Point	73	200 Sierra Nevada	51
100 G & C	40	400 Seg Belcher	19
500 Hale & Norcross	90	50 Union	51
400 Mexican	61	100 Yellow Jacket	40
100 Mono	21		

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DECEMBER 18, 1894.

531,009.—CAR COUPLING—J. Clark, Hartland, Wasb.

531,022.—DISPLAY RACK—W. H. Conrad, Pasadena, Cal.

530,987.—INDEX—J. A. Fiscber, S. F.

531,172.—HARNESS—W. A. Fleming, S. F.

531,178.—HARP LOCK—F. A. Getze, Los Angeles, Cal.

531,045.—LAVATORY APPARATUS—D. Kstas, Seattle, Wasb.

531,003.—TRUNK—K. S. O'Keefs, S. F.

531,050.—SEWING MACHINE—F. O'Neill, Redlands, Cal.

531,132.—MAGAZINE GUN—W. H. Ostrander, S. F.

531,005.—ELECTRIC CONVERTER—F C. Priestly, S. F.

531,006.—DYNAMOMETER—R. J. Rolfson, S. F.

531,134.—FIRE-PROOF BUILDING—J. W. Rowell, S. F.

531,068.—ORE CRUSHER—A. H. Scbierbolz, S. F.

531,231.—FARE REGISTER—E. T. Taylor. Oakland, Cal.

531,232.—SUSPENSORY—John Teuscher, Jr., Bridal Veil, Or.

531,074.—CENTRIFUGAL PUMP—M. Wagner, Tacoma, Wasb.

NOTE.—Copies of U. S. and Foreign patents furnisbed by Dewey & Co. in the sbortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

MAGAZINE GUN.—W. H. Ostrander, San Francisco. No. 531,132. Dated Dec. 18, 1894. This invention relates to improvements in magazine guns, and it is especially applicable to that class of magazine guns or repeaters having two barrels upon a single stock like a shotgun, with magazines heneath and mechanism wherehy supplemental cartridges carried in these magazines may he elevated and introduced into the barrels after the previous cartridges have heen discharged therefrom. The barrels are slidahle upon the fore end and an intermediate mechanism consisting of slidahle racks, movable with the harrels and pinions engaged by the racks, actuate carriers hy which the cartridges are lifted from the magazine to a position opposite the open rear end of the harrel; means for disengaging either pinion so as to allow one mechanism to he actuated independently when hut one barrel is to he recharged; connecting mechanism by which the hammers are retracted and the gun placed in position for firing, and locking devices hy which the safety of the gun is assured when it is not in actual use.

FARE REGISTER.—Edward T. Taylor, Oakland, Cal. No. 531,281. Dated Dec. 18, 1894. This invention relates to a device for registering fares collected, and is especially adapted for use upon street cars and similar conveyances. It consists of a registering device comprising toothed disks of different diameters journaled to turn ahout a common center post, the outer disk having its peripheral rim thickened so that its face is approximately in the same plane with the face of the inner disk, figures made upon the faces and near the peripheries of these disks corresponding with the number of teeth therein; a pawl mechanism whereby the outer disk is advanced tooth by tooth until a single rotation is completed; a radially slidable plate, the outer end of which is adapted to register with the final notch of the outer disk, and a pawl on said plate adapted to engage the inner disk, whereby the inner disk is advanced one tooth at the completion of each rotation of the outer disk; a dial having its face, near the periphery, marked to correspond with the teeth of the outer disk, and slots made in one side on a horizontal line with the center through which one line of figures upon the two disks is exposed simultaneously, and an index hand or pointer movable over the dial in unison with the movement of the outer disk.

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Bulwer Con M Co, Cal	10	5c	Dec 11,	Jan 16, Feb 15	J E Jacobus, 309 Montgomery
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Hale & Norcross, Nev	106	25c	Nov 23,	Dec 29, Jan 23	A B Thompson, 309 Montgomery
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Savage M Co, Nev	85	20c	Dec 4,	Jan 7, Jan 28	E B Holmes, 309 Montgomery
Silver Hill, Nev	34	5c	Nov 19,	Dec 26, Jan 16	D H Bates, 309 Montgomery
Union Con S M Co, Nev	50	20c	Nov 22,	Dec 27, Jan 16	C C Harvey. 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Silver King M Co, Nev	J W Pew, 310 Pine.	Jan 8

Why the Accidents Happen.

H. C. Acker, Colorado State Inspector of metalliferous mines, has made his official report to Governor Waite for the past two years. The report gives the following recapitulation of the condition of mining labor in that State: Number of miners working, 16,794; mines visited, 985; number of visits, 1,232; fatal accidents, 50; non-fatal accidents, 100; miles traveled, 34,287. On the subject of accidents and their prevention Mr. Acker says:

"Many accidents have been caused by attempts to drill out loaded holes which have failed to explode; deficient cages have caused others; tamping loaded holes with metal bars has contributed its quota to the death list, and it has happened that weak timbers were responsible for deaths because they were set by an incompetent man.

"Generally speaking, mine owners have shown a commendable disposition to promptly comply with all reasonable regulations having in view the safety and protection of the men in their employ. The law providing for the inspection of metalliferous mines has for its main object the protection of the lives of the most numerous class of our wage-workers engaged in what is perhaps the most hazardous of all occupations. Skilled miners know these dangers and generally do their best to avoid them, but incompetent men sometimes employed at lower wages not only endanger themselves, but often cause the loss of the lives and property of others.

"To obviate these direful results, and in view of the fact that druggists and plumhers are required by state law to fit themselves by study and experience to fulfill their duties with safety to their fellowmen, miners should he required to give some evidences of their qualifications hefore being employed. Corporate owners should also he compelled to see that foremen and those directly in charge of bodies of men engaged in so hazardous an employment as mining are competent to carefully care for the safety of the men under them."

He also recommends that no giant powder be stored within 100 feet of the mouth of the shaft or tunnel, and the adoption of an eight-hour law for miners.

A Word With Advertisers.

Change your advertisements regularly. Don't regard your spaee in the paper as a sign to be simply glaneed at, but, rather, as a plaee where you ean tell your eustomers and friends what you have for sale. Let them know what you make a specialty of from time to time. Make your advertisements readable and buyers will read them. Don't forget that a neat little engraving always attraets attention to the body of the advertisement. Again, don't try to print a whole catalogue in a two-ineh spaee. It's the white paper between the lines that makes an advertisement readable, not the amount of information you may try to crowd in. And don't insist on your name being printed in the largest and blaekest type that can be found. Tell your friends what you have for sale in a few well-ehosen words, and they will notiee your name no matter how small the type used.—West Coast Lumberman.

"Ore Deposits of the United States."

The second edition of this work by J. F. Kemp, revised and enlarged, is received. The book is rewritten throughout. The subjeet is a vast one, and where so much regarding theory and practice has been published, it sometimes happens that what is good is not new, and what is new is not good. In this instance, however, every one of the 328 pages is replete with up-to-date information of a praetical nature, with just enough theory to make it interesting. Assuming at the outset on the part of the reader some slight aequaintanee with geology and mineralogy, the author has eondensed the researehes of reeent investigators, and where not original, an elaborate system of references gives in every instance the source of his statements.

The matter of origin and formation, struetural features of ore veins, classifieation of deposits, ete., are diseussed intelligently and the several sections of the country with their principal ores given eareful notation.

The eondensed nature of the work makes it more a text-book, or volume of referenee, than more voluminous writings on the same subjeet, this idea being elearly one of the purposes of the author. The work contains nearly 100 illustrations and is well gotten up typographieally. It is issued by the Scientific Publishing Co., 253 Broadway, N. Y. Priee, $4.

"THE ANNUAL REPORT of the Smithsonian Institute for the year ending June 30, 1893," is reeeived, an elaborate work of nearly 800 pages. It is replete with authentic seientific information, and is handsomely illustrated. Most of the eontents are reprint. About the most interesting article is "Fundamental Units of Measure," by Prof. T. C. Mendenhall. "The Wanderings of the North Pole," by Sir Robt. Ball, is also a notable eontribution.

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The Mineral Hydrocarbons.

Their History, Geography, Geology, Physical and Chemical Properties and Uses.

NUMBER XVII.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

We will consider the oil wells in the order of the number by which they are designated on the map (published with the report).

No. 1 is a well thirty feet in diameter full of tarry oil, boiling with the escape of marsh gas. It is situated in the midst of a gentle slope, forming part of a terrace or plain situated at least 1000 feet above the sea. The plain, which is one and one-quarter miles long by three-fourths of a mile wide, appears to have been formed by the long accumulation of asphaltum from the evaporation of the overflow of this great oil spring. The depth of this great mass of asphaltum is, of course, a matter of conjecture, as no explorations have been made upon it; but it is probably safe to estimate its contents on a mile square at one yard in depth, which would give over three million cubic yards of fuel, from which a good coke is readily prepared, or which is even by distillation capable of yielding a large return of oil. Over this area there are several minor points of tarry overflow, but we consider the whole one great oil spring. * * *

I learn from Mr. George S. Gilbert, who had a small refinery near by, on both the east and west ends of the oil range, that the petroleum of the great spring now under consideration gave a very large yield of oil. The same person is my authority for the statement that asphaltum in a very poor and ill-suited set of D. retorts yielded fifty gallons of oil to the ton.

No. 2 is a series with numerous openings in the face of the first table or terrace, about 75 or 100 feet above the Sisaw, and discharging into the valley of that stream. These openings plainly belong to one fissure or eropping at a considerably lower level than the great basin before deseribed. Some thin oil is seen percolating from these outcrops.

No. 3 is an area of asphaltum three-quarters of a mile long by half a mile in width, exuding tar and rock oil at very numerous points, especially along the arroyo. In position it is a little above the great lagoon No. 1.

No. 4 is a beautiful spring of oil and thin tar. This is a large and fine spring showing more oil than either of the other outcrops.

No. 5 is a small, well-defined spring of thick oil. The oil produced by these last two springs was found in Mr. Gilbert's experiments, as he assures me, of superior quality, he esteeming them equal to any in the region for the value of their products.

No. 6 is a distinct group of outcrops of thin tar, north of the Lione branch of the San Antonio creek.

These are all the outcrops of which I made notes. The whole development is amazing, and it is plain to the least instructed person that the amount of oil capable of being produced here is almost without limit. Even without artesian wells, using the coke of the asphalt as fuel and the asphalt itself as material, a vast quantity of oil can be distilled, while the natural flow of the several springs, if concentrated simply by open cuts and ditches and conducted to covered tanks, must produce a considerable amount daily. Compared to the original show on Oil creek, in Pennsylvania, the outcrops on Rancho Ojai are truly surprising.

Although on the maps the outcrops are limited by six groups numerically considered, they certainly exceed twenty places of discharge, and at least as many more where oil has flowed in former times, but where now only solid moss-grown rocks of asphaltum attest its former activity.

In the description of the great spring marked No. 1 on the map, it is stated that the deposit of asphaltum produced from the former overflow of the spring is probably one yard thick and one mile square, expressly stating that the thickness (not the area) is conjectural. To show those not accustomed to contemplate the enormous products resulting from the combination of a few simple measurements, when applied to such large units as a square mile, let us observe that in the 640 acres contained in one square mile there are in one yard in depth 3,400,000 cubic yards. Granting that the density of the asphaltum is only one (specific gravity 1), water being unity (it is in fact 1.2 or thereabout), it appears that each cubic yard of this fossil fuel weighs in round numbers 1700 pounds; but $3,400,000 \times 1700 = 5,780,000,000$ pounds, or 2,890,000 tons. If each ton yields 50 gallons of oil, the product of this large quantity of asphaltum turned into oil would be 144,500,000 gallons, and an amount of coke which will correspond to at least one-third of the original weight of the asphaltum. If an effort is made to estimate the money value of these products, calling the coke nothing, it will be found to reach a figure almost fabulous.

(To be Continued.)

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Mello & Costa, in the Spring Valley mine, near Cherokee, Butte Co., to deposit tailings on flat ground; from H. E. Pickett, in the Kentucky Flat mine, near Georgetown, El Dorado Co., to deposit tailings behind a dam in North Otto creek; from Wm. Johnson, in his mine near Volcano, Amador Co., to deposit tailings behind a dam in Clapboard gulch; from El Dorado Water and Deep Gravel Mining Co., in the Henrietta mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a dry ravine; from Leroy Hedge, in his mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Rolland & Vanderburg, in the Epley mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from the York Mining Co., in its mine near Brownsville, Yuba Co., to deposit tailings behind a dam in a ravine; from Hancock & Daly, in the Last Chance mine, near Placerville, El Dorado Co., to deposit tailings behind a dam in a ravine; from Goodman Bros. and Goodman & Bund, in their mines near Volcano, Amador Co., to deposit tailings behind a dam in Ashland creek; from Hadley & Bolles, in the 49 Flat mine, near Volcano, Amador Co., to impound tailings behind a dam in 49 gulch; and from G. A. Melnecke et al., in the Fine Gold mine, near Vallicita, Calaveras Co., to impound tailings behind dams in a dry ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Jan. 14, 1895, at 1:30 P. M.

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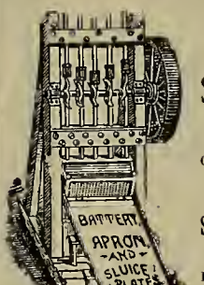

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